



Text Part Number: 78-3224-08

Input/Output Controller Replacement Instructions

Product Numbers: C7200-I/O-FE-MII=, C7200-I/O=, C7200-I/O-FE=, UBR7200-I/O=, UBR7200-I/O-FE=, CISCO7202=, CISCO7204=, CISCO7206=, CISCO7204VXR=, CISCO7206VXR=, CHAS-UBR7246=, CHAS-UBR7223=, RS7206S=

Introduction

This document explains how to remove and replace the Input/Output (I/O) controller, which can be used in the following platforms:

- Cisco 7200 series routers—which consist of the 2-slot Cisco 7202, 4-slot Cisco 7204 and Cisco 7204VXR, and the 6-slot Cisco 7206
- Cisco uBR7200 series universal broadband routers—which consist of the 3-slot Cisco uBR7223 (1 port adapter slot and 2 cable modem card slots) and the 6-slot Cisco uBR7246 (2 port adapter slots and 4 cable modem card slots)

It includes instructions for powering down a router, removing an installed I/O controller, and installing a new I/O controller in the router. This document also includes steps for verifying the initialization of the installed I/O controller after you power up the router.

Note The Cisco 7206 can be used as a router shelf in a Cisco AS5800 Universal Access Server. References to the Cisco 7200 series routers in this document include the Cisco 7206 as a router shelf in a Cisco AS5800 Universal Access Server, unless indicated otherwise.

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- Additional Information, page 39
- FCC Class B Compliance, page 49
- Cisco Connection Online, page 50

If You Need More Information

Your router and the Cisco IOS software running on it contain extensive features and functionality, which are documented in the following resources:

- Cisco Documentation CD-ROM package

Cisco documentation and additional literature are available in a CD-ROM package, which ships with your product. The Documentation CD-ROM, a member of the Cisco Connection Family, is updated monthly; therefore, it might be more up to date than printed documentation. To order additional copies of the Documentation CD-ROM, contact your local sales representative or call customer service. The CD-ROM package is available as a single package or as an annual subscription.

If you are reading Cisco product documentation on the World Wide Web, you can submit comments electronically. Click **Feedback** on the toolbar and select **Documentation**. After you complete the form, click **Submit** to send it to Cisco. We appreciate your comments.

- For Cisco IOS software configuration information and support, refer to the modular configuration and modular command reference publications in the Cisco IOS software configuration documentation set that corresponds to the software release installed on your Cisco hardware.
- For hardware installation and maintenance information on the Cisco 7200 VXR routers, refer to the *Cisco 7200 VXR Installation and Configuration Guide* that shipped with your router.
- For hardware installation and maintenance information on the Cisco 7200 routers, refer to the following publications that shipped with your router:
 - *Cisco 7202 Installation and Configuration Guide*
 - *Cisco 7204 Installation and Configuration Guide*
 - *Cisco 7206 Installation and Configuration Guide*
- For hardware installation and maintenance information and software configuration information on the Cisco AS5800 Universal Access Server, refer to the following publications:
 - *Cisco AS5800 Universal Access Server Hardware Installation and Configuration Guide*
 - *Cisco AS5800 Universal Access Server Software Installation and Configuration Guide*
- For hardware installation and maintenance information on the Cisco uBR7200 series routers, refer to the *Cisco uBR72xx Universal Broadband Router Installation and Configuration Guide* that shipped with your router.

- For international agency compliance, safety, and statutory information for wide-area network (WAN) interfaces for the Cisco 7200 series routers, the Cisco AS5800 Universal Access Server, and the Cisco uBR7200 series routers refer to the following publications:
 - *Regulatory Compliance and Safety Information for the Cisco 7200 Series Routers*
 - *Cisco AS5800 Universal Access Server Regulatory Compliance and Safety Information.*
 - *Regulatory Compliance and Safety Information for the Cisco uBR72xx Universal Broadband Router.*
- For general information about documentation, refer to the “Cisco Connection Online” section on page 50, or call customer service at 800 553-6387 or 408 526-7208. Customer service hours are 5:00 a.m. to 6:00 p.m. Pacific time, Monday through Friday (excluding Cisco-observed holidays). You can also send e-mail to cs-rep@cisco.com.

Note You can access Cisco IOS software configuration and hardware installation and maintenance documentation on the World Wide Web at <http://www.cisco.com>, <http://www-china.cisco.com>, or <http://www-europe.cisco.com>.

Input/Output Controller Description

The Input/Output controller shares the system memory functions and the environmental monitoring functions with the network processing engine in the Cisco 7200 series routers and Cisco uBR7200 series routers.

The I/O controller consists of the following components:

- Dual EIA/TIA-232 channels for local console and auxiliary ports. The console port has full data communications equipment (DCE) functionality and a DB-25 receptacle. The auxiliary port has full data terminal equipment (DTE) functionality and a DB-25 plug.
- An optional Fast Ethernet port that is configurable for use at 100 megabits per second (Mbps) full-duplex or half-duplex (half-duplex is the default). The Fast Ethernet port is equipped with either a single MII receptacle (see Figure 1) or an MII receptacle and an RJ-45 receptacle (see Figure 2). Although still supported by Cisco Systems, the I/O controller equipped with the single MII receptacle was discontinued as an orderable product in May, 1998. The I/O controller without the Fast Ethernet port is shown in Figure 3.

Note When using the I/O controller that is equipped with an MII receptacle and an RJ-45 receptacle, only one receptacle can be configured for use at a time.

You can install an I/O controller with or without a Fast Ethernet port in all Cisco 7200 series routers (including the Cisco 7206 as a router shelf in a Cisco AS5800 Universal Access Server); however, when you install an I/O controller with a Fast Ethernet port in a Cisco 7202, the system software automatically disables the port.

If you order an I/O controller as a spare for a Cisco uBR7200 series router, use the product numbers UBR7200-I/O= (without a Fast Ethernet port) or UBR7200-I/O-FE= (with a Fast Ethernet port). These I/O controllers have the boot helper image used by a Cisco uBR7200 series router loaded on the Flash memory SIMMs. The Cisco 7200 series I/O controller spares (C7200-I/O-FE-MII=, C7200-I/O-FE=, and C7200-I/O=) do not have the Cisco uBR7200 series boot helper image loaded on the Flash memory SIMMs.

- Nonvolatile random-access memory (NVRAM) for storing the system configuration and environmental monitoring logs. When replacing the I/O controller, be sure to copy the router's running configuration to a Trivial File Transfer Protocol (TFTP) file server so that you can retrieve it later; otherwise, you will have to reenter your configuration manually. NVRAM uses lithium batteries to maintain its contents when disconnected from power.
- Two Personal Computer Memory Card International Association (PCMCIA) slots for Flash Disks or Flash memory cards.
- Flash memory SIMM and Flash Disks or Flash memory cards for storing the boot helper image and the default Cisco IOS software image.
- Boot ROM for storing sufficient code for booting the Cisco IOS software.
- Two environmental sensors for monitoring the cooling air as it enters and leaves the chassis.

Figure 1 Input/Output Controller—with Fast Ethernet Port (Single MII Receptacle)

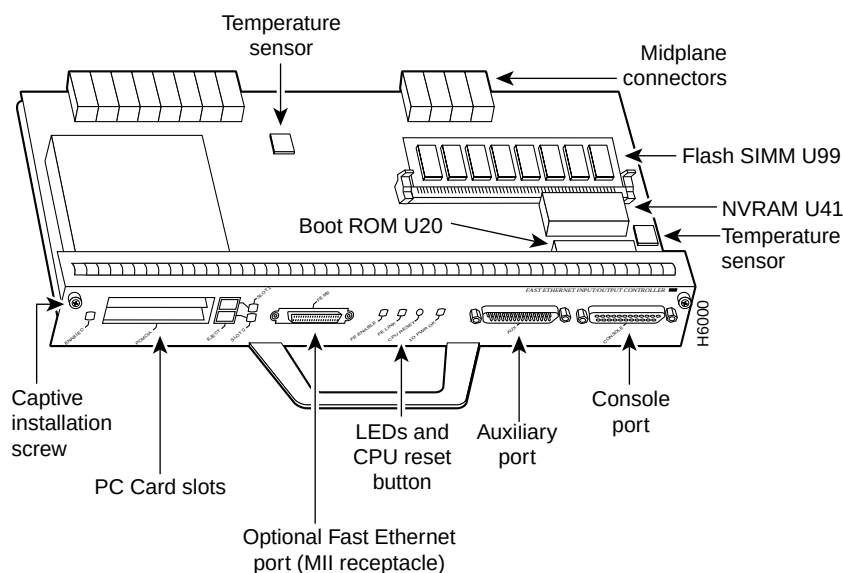


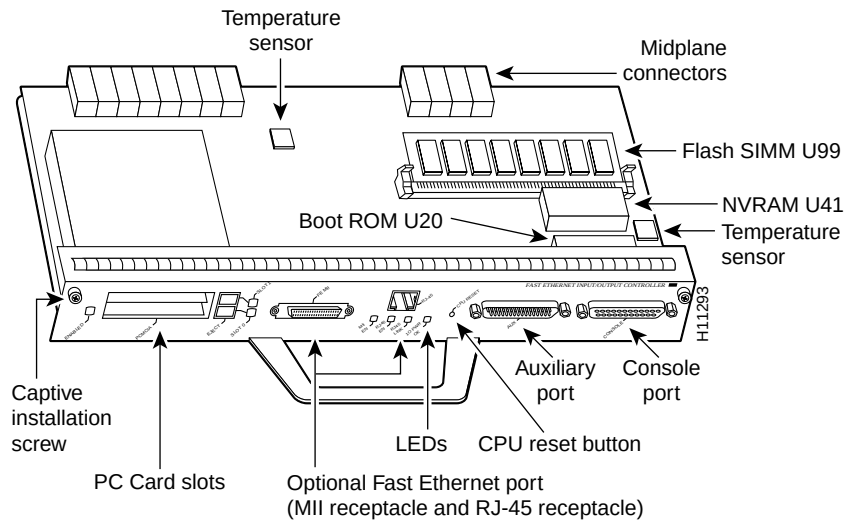
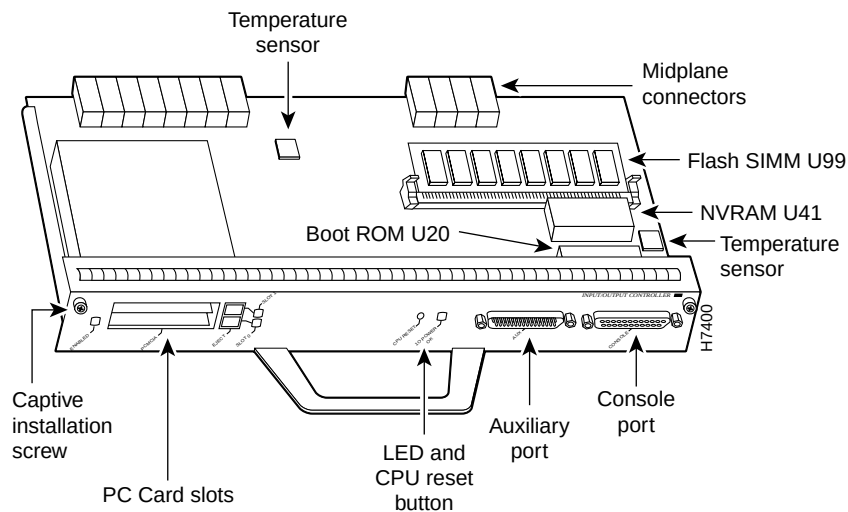
Figure 2 Input/Output Controller—with Fast Ethernet Port (MII and RJ-45 Receptacles)**Figure 3** Input/Output Controller—without Fast Ethernet Port

Table 1 lists the I/O controller memory components.

Table 1 Input/Output Controller Memory Components

Type	Size	Quantity	Description	Location
Boot ROM	256 KB	1	EPROM for the ROM monitor program	Socket U20
Flash SIMM	8 MB	1	Contains the default boot helper image	Socket U99
Flash memory card	8 to 20 MB	Up to 2	Contains the default Cisco IOS image	PCMCIA Slot 0 and slot 1
Flash Disk	40 or 110 MB	Up to 2	Contains the default Cisco IOS image	
NVRAM	128 KB	1	Nonvolatile EPROM for the system configuration file	Socket U41

Table 2 lists the factory-installed Flash memory card options and their product numbers, and Table 3 lists the Flash Disk memory options and their product numbers.

Table 2 Flash Memory Card Options

Memory Size ¹	Product Number
16 MB	MEM-I/O-FLC16M ²
20 MB	MEM-I/O-FLC20M ²

- 1 Refer to the Cisco AS5800 Universal Access Server documentation listed in the “If You Need More Information” section on page 2, for Cisco AS5800 Universal Access Server Flash memory card options.
- 2 These products are also available as Flash card upgrades. To order an upgrade, add an equal sign (=) after the product number, for example, MEM-I/O-FLC16M=.

Table 3 Flash Disk Memory Options

Memory Size	Product Number
40 MB	MEM-I/O-FLD40M ¹
110 MB	MEM-I/O-FLD110M

- 1 These products are also available as Flash Disk upgrades. To order an upgrade, add an equal sign (=) after the product number, for example, MEM-I/O-FLD110M=.

Depending on whether the Fast Ethernet port is present, up to five LEDs on the I/O controller faceplate indicate system status; two additional LEDs indicate the status of the Flash Disk or Flash memory cards installed in either PCMCIA slot.

Figure 4 shows the LEDs on the I/O controller with the Fast Ethernet port equipped with a single MII receptacle. Figure 5 shows the LEDs on the I/O controller with the Fast Ethernet port that is equipped with an MII receptacle and an RJ-45 receptacle. Figure 6 shows the LEDs on the I/O controller without the Fast Ethernet port. Table 4 lists I/O controller LEDs and their functions.

A CPU reset button is located next to the IO power OK LED or next to the auxiliary port on the I/O controller faceplate. The CPU reset button resets the entire system.



Caution To prevent system errors and problems, use the CPU reset button only at the direction of your service representative.

Figure 4 I/O Controller LEDs and CPU Reset Button—with Fast Ethernet Port (Single MII Receptacle)

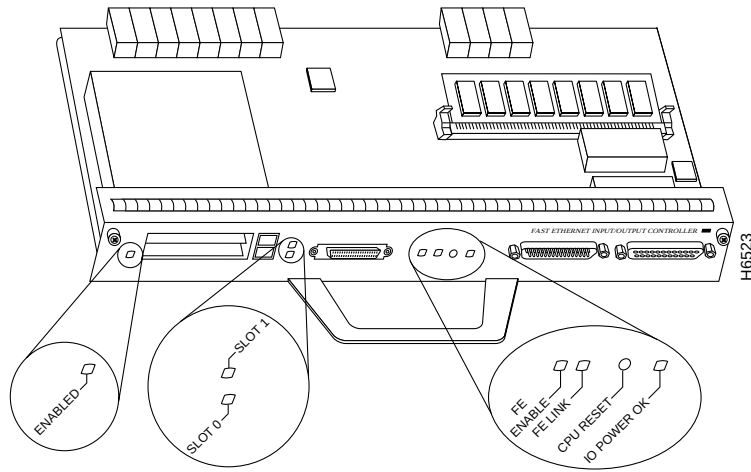


Figure 5 I/O Controller LEDs and CPU Reset Button—with Fast Ethernet Port (MII and RJ-45 Receptacles)

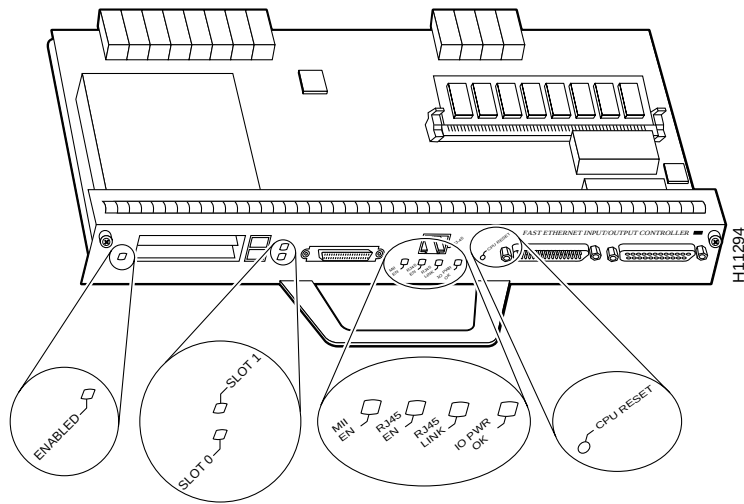
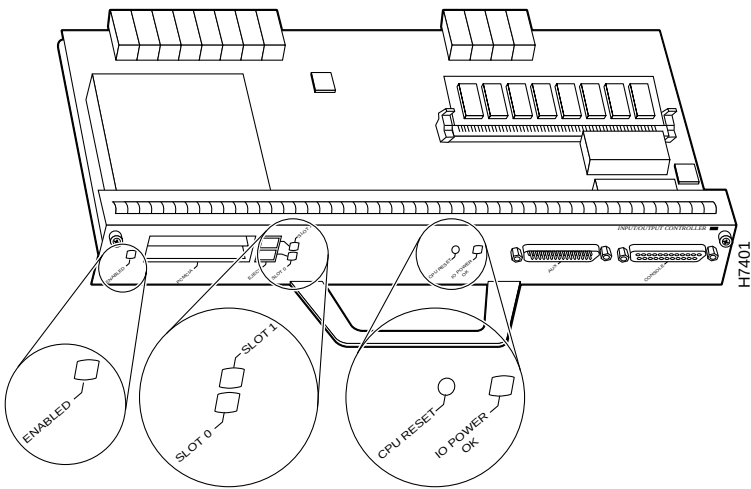


Figure 6 I/O Controller LEDs and CPU Reset Button—without Fast Ethernet Port



Note LEDs are either on or off. The LED state (on or off), not the color, determines the status of connection as described in Table 4. However, most LEDs are green when on, with the exception of the IO Power LED, which is orange when in the on state.

Table 4 I/O Controller LEDs

LED	Function
Enabled	Indicates that the network processing engine and the I/O controller are enabled for operation by the system; however, it does not mean that the Fast Ethernet port on the I/O controller is functional or enabled. This LED goes on during a successful router boot and remains on during normal operation of the router.
IO Power OK	Indicates that the I/O controller is on and receiving DC power from the router midplane. This LED comes on during a successful router boot and remains on during normal operation of the router.
FE ENABLE	Indicates that the Fast Ethernet port is initialized and enabled for operation by the system. This LED comes on after the I/O controller has been enabled and remains on during normal operation of the router. This LED is disabled by the system software when the I/O controller with the Fast Ethernet port is installed in a Cisco 7202.
FE LINK	Indicates that the Fast Ethernet port has established a valid link with the network. This LED remains off during normal operation of the router, unless there is an incoming carrier signal. This LED is disabled by the system software when the I/O controller with the Fast Ethernet port is installed in a Cisco 7202.
MII EN	Indicates that the Fast Ethernet port's MII receptacle is initialized and enabled by the system, and is configured for operation. This LED comes on after the I/O controller has been enabled and the MII receptacle has been configured as the media type for the Fast Ethernet port (the RJ-45 receptacle is the default media type for the Fast Ethernet port). This LED remains on during normal operation of the router. This LED is disabled by the system software when the I/O controller with the Fast Ethernet port is installed in a Cisco 7202.

Table 4 I/O Controller LEDs (continued)

LED	Function
RJ45 EN	Indicates that the Fast Ethernet port's RJ-45 receptacle (the default media type for the Fast Ethernet port) is initialized and enabled by the system. This LED comes on after the I/O controller has been enabled and remains on during normal operation of the router. This LED is disabled by the system software when the I/O controller with the Fast Ethernet port is installed in a Cisco 7202.
RJ45 LINK	Indicates that the Fast Ethernet port's RJ-45 receptacle has established a valid link with the network. This LED remains off during normal operation of the router unless there is an incoming carrier signal. This LED is disabled by the system software when the I/O controller with the Fast Ethernet port is installed in a Cisco 7202.
Slot 0 Slot 1	These LEDs indicate which PCMCIA slot is in use by coming on when either slot is being accessed by the system. These LEDs remain off during normal operation of the router.

Note An MII LINK LED is not provided on the I/O controller because the LED is provided on external transceivers that are required for connecting to the MII receptacle on the I/O controller. See the “Fast Ethernet MII Connection Equipment” section on page 40 for Fast Ethernet MII connection requirements.

Use the **show diag 0** command to identify the I/O controller type (with or without the Fast Ethernet port) that is installed in your Cisco 7200 series router or Cisco uBR7200 series router.

Note Slot 0 in Cisco 7200 series routers (including the Cisco 7206 as a router shelf in a Cisco AS5800 Universal Access Server) and Cisco uBR7200 series routers is always reserved for the Fast Ethernet port on the I/O controller, if present. If the I/O controller without the Fast Ethernet port is installed in your Cisco 7200 series router or Cisco uBR7200 series router, the system software will not display output for the **show diag 0** command. If you have an I/O controller with the Fast Ethernet port installed in your Cisco 7202 router, the system software will indicate in output for the **show diag 0** command that the Fast Ethernet port is disabled.

The following example of the **show diag 0** command shows an installed I/O controller with the Fast Ethernet port that is equipped with an MII receptacle and RJ-45 receptacle:

```
Router> show diag 0
Slot 0:
Fast-ethernet on C7200 I/O with MII or RJ45 port adapter, 1 port
Port adapter is analyzed
Port adapter insertion time 00:10:42 ago
Hardware revision 2.0          Board revision A0
Serial number 3511336          Part number 73-1537-03
Test history 0x0              RMA number 00-00-00
EEPROM format version 1
EEPROM contents (hex):
0x20: 01 14 02 00 00 35 94 28 49 06 01 03 00 00 00 00
0x30: 50 0000 00 FF FF FF FF FF FF FF FF FF FF FF FF
```

The following example of the **show diag 0** command is from a Cisco 7202 that has an installed I/O controller with the Fast Ethernet port. The text “Port adapter disabled” in the command output indicates that the Fast Ethernet port on the I/O controller is disabled.

```
Router> show diag 0
Slot 0:
Fast-ethernet on C7200 I/O with MII or RJ45 port adapter, 1 port
Port adapter disabled
Port adapter insertion time 00:10:42 ago
Hardware revision 2.0          Board revision A0
Serial number 3511336          Part number 73-1537-03
Test history 0x0              RMA number 00-00-00
EEPROM format version 1
EEPROM contents (hex):
0x20: 01 14 02 00 00 35 94 28 49 06 01 03 00 00 00 00
0x30: 50 0000 00 FF FF FF FF FF FF FF FF FF FF FF FF
```

Additionally for the Cisco 7202, the following message appears in the system banner if an I/O controller with the Fast Ethernet port is installed in the system:

```
%C7200-3-UNSUPPORTED: FE in slot0 is not supported on C7202 chassis
```

If the above message appears, the Fast Ethernet port on the I/O controller is automatically disabled. If the above message does not appear, your Cisco 7202 has an installed I/O controller without the Fast Ethernet port.

The RJ-45 receptacle is the default media type for the I/O controller equipped with an MII receptacle and an RJ-45 receptacle. Use the **media-type** command to change the I/O controller’s media type and the **show interfaces** command to verify the change. The following example configures the MII receptacle as the media type for the I/O controller:

```
Router# config t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)# interface fastethernet 0/0
Router(config-if)# media-type mii
Router(config-if)# no shutdown
Router(config-if)# exit
Router(config)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed
state to up
%LINK-3-UPDOWN: Interface FastEthernet0/0, changed state to up

Router# sh interface fastethernet 0/0
FastEthernet0/0 is administratively up, line protocol is up

(display text omitted)

Encapsulation ARPA, loopback not set, keepalive not set, hdx, MII

(display text omitted)
```

Use the **media-type 100BaseX** command to return the media type to the RJ-45 receptacle.

The default transmission mode for the Fast Ethernet port on the I/O controller is half-duplex. Use the **full-duplex** command to change the Fast Ethernet port's transmission mode, and use the **show interfaces** command to verify the change as follows:

```
Router# config t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)# interface fastethernet 0/0
Router(config-if)# full-duplex
Router(config-if)# no shutdown
Router(config-if)# exit
Router(config)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed
state to up
%LINK-3-UPDOWN: Interface FastEthernet0/0, changed state to up

Router# sh interface fastethernet 0/0
FastEthernet0/0 is administratively up, line protocol is up

(display text omitted)

Encapsulation ARPA, loopback not set, keepalive not set, fdx, 100BaseTX

(display text omitted)
```

Use the **no full-duplex** command to return the Fast Ethernet port on the I/O controller to half-duplex transmission mode.

Note In a Cisco 7206 router shelf, the interface specified in the above examples would include a shelf number. For example, the command **interface fastethernet 5/0/0** would specify the Fast Ethernet interface on the I/O controller (slot 0) in Cisco 7206 router shelf 5. For information about the Cisco AS5800 Universal Access Server router shelf, refer to the Cisco AS5800 Universal Access Server documentation listed in the “If You Need More Information” section on page 2.

Note Certain Cisco hardware products have incorporated a hardware change, which for most users, is transparent. However, an anomaly has been identified when this updated Cisco hardware is used in conjunction with certain releases of Cisco IOS software. (See the “Troubleshooting Using the show interfaces fastethernet Command” section on page 37 for an explanation of this anomaly and a workaround procedure.)

Installation Prerequisites

This section provides a list of parts and tools you need to remove and replace the I/O controller in the Cisco 7200 series routers or Cisco uBR7200 series routers. This section also includes safety and ESD-prevention guidelines to help you avoid injury to yourself and damage to the equipment.

List of Parts and Tools

You need the following tools and parts to remove and replace the I/O controller. If you need additional equipment, contact a service representative for ordering information:

- A new I/O controller
- Number 2 Phillips and a 3/16-inch, flat-blade screwdriver

- An 8-mm wrench or nut driver, or adjustable wrench (for connecting a grounding lug to a Cisco uBR7200 series DC-input power supply)
- A 7-mm wrench or nut driver, or adjustable wrench (for connecting the DC-input power lead strain-relief cover to a DC-input power supply)
- Tape (for securing the switch handle of a DC circuit breaker in the OFF position)
- Your own ESD-prevention equipment or the disposable grounding wrist strap included with all upgrade kits, FRUs, and spares
- An antistatic mat or surface, or static-shielding bag
- Small pliers

Software and Hardware Requirements

Table 5 lists the recommended minimum Cisco IOS software release to use the I/O controller in supported router platforms.

Table 5 I/O Controller Software and Hardware Requirements

Router Platform	I/O Controller		
	With Fast Ethernet Port (Single MII Receptacle)	With Fast Ethernet Port (MII and RJ-45 Receptacles)	Without Fast Ethernet Port
Cisco 7200 series • Cisco 7204VXR and Cisco 7206VXR • Cisco 7204 and Cisco 7206 • Cisco 7202 ¹ • Cisco 7206 router shelf ²	Cisco IOS Release 12.0(3)T or later releases of 12.0 T Cisco IOS Release 12.0(2)XE2 or later releases of 12.0 XE Cisco IOS Release 11.1(17)CA or later releases of 11.1CA Cisco IOS Release 11.2(12)P or later releases of 11.2P Cisco IOS Release 11.3(2)T or later releases of 11.3 T Cisco IOS Release 11.3(2)AA or later releases of 11.3 AA Cisco IOS Release 11.1(19)CC1 or later releases of 11.1 CC Cisco IOS Release 11.3(4)AA or later releases of 11.3 AA Cisco IOS Release 11.3(2)AA or later releases of 11.3 AA		
Cisco uBR7200 series universal broadband routers ³	⁴	Cisco IOS Release 11.3(6)NA or later releases of 11.3 NA	

- 1 You can install an I/O controller with or without a Fast Ethernet port in a Cisco 7202; however, when you install an I/O controller with a Fast Ethernet port, the Cisco 7202 system software automatically disables the port.
- 2 The Cisco 7206 can be used as a router shelf in a Cisco AS5800 Universal Access Server. For information about the Cisco AS5800 Universal Access Server, refer to the Cisco AS5800 Universal Access Server documentation listed in the “If You Need More Information” section on page 2.
- 3 If you need to order a spare I/O controller for a Cisco uBR7200 series router, use the product number UBR7200-I/O-FE= (with Fast Ethernet port) or UBR7200-I/O= (without Fast Ethernet port). These I/O controllers have the Cisco uBR7200 series boot helper image loaded on the Flash SIMMs.
- 4 Initial shipments of Cisco uBR7246 chassis that were equipped with a Fast Ethernet I/O controller might have an I/O controller with the single MII receptacle installed. These I/O controllers are fully compatible with the router. If you need to order a spare I/O controller, use the product numbers described in the previous footnote.

Safety Guidelines

Following are safety guidelines that you should follow when working with any equipment that connects to electrical power or telephone wiring.



Warning Only trained and qualified personnel should be allowed to install or replace this equipment.

Safety Warnings



Warning This warning symbol means *danger*. You are in a situation that could cause bodily injury. Before you work on any equipment, be aware of the hazards involved with electrical circuitry and be familiar with standard practices for preventing accidents. To see translations of the warnings that appear in this publication, refer to the *Regulatory Compliance and Safety Information* document that accompanied this device.

Waarschuwing Dit waarschuwingssymbool betekent gevaar. U verkeert in een situatie die lichamelijk letsel kan veroorzaken. Voordat u aan enige apparatuur gaat werken, dient u zich bewust te zijn van de bij elektrische schakelingen betrokken risico's en dient u op de hoogte te zijn van standaard maatregelen om ongelukken te voorkomen. Voor vertalingen van de waarschuwingen die in deze publicatie verschijnen, kunt u het document *Regulatory Compliance and Safety Information* (Informatie over naleving van veiligheids- en andere voorschriften) raadplegen dat bij dit toestel is ingesloten.

Varoitus Tämä varoitusmerkki merkitsee vaaraa. Olet tilanteessa, joka voi johtaa ruumiinvammaan. Ennen kuin työskentelet minkään laitteiston parissa, ota selvää sähkökytkentöihin liittyvistä vaaroista ja tavanomaisista onnettomuuksien ehkäisykeinoista. Tässä julkaisussa esiintyvien varoitusten käännökset löydät laitteen mukana olevasta *Regulatory Compliance and Safety Information* -kirjasta (määräysten noudattaminen ja tietoa turvallisuudesta).

Attention Ce symbole d'avertissement indique un danger. Vous vous trouvez dans une situation pouvant causer des blessures ou des dommages corporels. Avant de travailler sur un équipement, soyez conscient des dangers posés par les circuits électriques et familiarisez-vous avec les procédures couramment utilisées pour éviter les accidents. Pour prendre connaissance des traductions d'avertissements figurant dans cette publication, consultez le document *Regulatory Compliance and Safety Information* (Conformité aux règlements et consignes de sécurité) qui accompagne cet appareil.

Warnung Dieses Warnsymbol bedeutet Gefahr. Sie befinden sich in einer Situation, die zu einer Körperverletzung führen könnte. Bevor Sie mit der Arbeit an irgendeinem Gerät beginnen, seien Sie sich der mit elektrischen Stromkreisen verbundenen Gefahren und der Standardpraktiken zur Vermeidung von Unfällen bewußt. Übersetzungen der in dieser Veröffentlichung enthaltenen Warnhinweise finden Sie im Dokument *Regulatory Compliance and Safety Information* (Informationen zu behördlichen Vorschriften und Sicherheit), das zusammen mit diesem Gerät geliefert wurde.

Avvertenza Questo simbolo di avvertenza indica un pericolo. La situazione potrebbe causare infortuni alle persone. Prima di lavorare su qualsiasi apparecchiatura, occorre conoscere i pericoli relativi ai circuiti elettrici ed essere al corrente delle pratiche standard per la prevenzione di incidenti. La traduzione delle avvertenze riportate in questa pubblicazione si trova nel documento *Regulatory Compliance and Safety Information* (Conformità alle norme e informazioni sulla sicurezza) che accompagna questo dispositivo.

Advarsel Dette varselsymbolet betyr fare. Du befinner deg i en situasjon som kan føre til personskade. Før du utfører arbeid på utstyr, må du være oppmerksom på de faremomentene som elektriske kretser innebærer, samt gjøre deg kjent med vanlig praksis når det gjelder å unngå ulykker. Hvis du vil se oversettelser av de advarslene som finnes i denne publikasjonen, kan du se i dokumentet *Regulatory Compliance and Safety Information* (Overholdelse av forskrifter og sikkerhetsinformasjon) som ble levert med denne enheten.

Aviso Este símbolo de aviso indica perigo. Encontra-se numa situação que lhe poderá causar danos físicos. Antes de começar a trabalhar com qualquer equipamento, familiarize-se com os perigos relacionados com circuitos eléctricos, e com quaisquer práticas comuns que possam prevenir possíveis acidentes. Para ver as traduções dos avisos que constam desta publicação, consulte o documento *Regulatory Compliance and Safety Information* (Informação de Segurança e Disposições Reguladoras) que acompanha este dispositivo.

¡Advertencia! Este símbolo de aviso significa peligro. Existe riesgo para su integridad física. Antes de manipular cualquier equipo, considerar los riesgos que entraña la corriente eléctrica y familiarizarse con los procedimientos estándar de prevención de accidentes. Para ver una traducción de las advertencias que aparecen en esta publicación, consultar el documento titulado *Regulatory Compliance and Safety Information* (Información sobre seguridad y conformidad con las disposiciones reglamentarias) que se acompaña con este dispositivo.

Warning! Denna varningssymbol signalerar fara. Du befinner dig i en situation som kan leda till personskada. Innan du utför arbete på någon utrustning måste du vara medveten om farorna med elkretsar och känna till vanligt förfarande för att förebygga skador. Se förklaringar av de varningar som förekommer i denna publikation i dokumentet *Regulatory Compliance and Safety Information* (Efterrättelse av föreskrifter och säkerhetsinformation), vilket medföljer denna anordning.

Electrical Equipment Guidelines

Follow these basic guidelines when working with any electrical equipment:

- Before beginning any procedures requiring access to the chassis interior, locate the emergency power-off switch for the room in which you are working.
- Disconnect all power and external cables before moving a chassis.
- Do not work alone when potentially hazardous conditions exist.
- Never assume that power has been disconnected from a circuit; always check.
- Do not perform any action that creates a potential hazard to people or makes the equipment unsafe.
- Carefully examine your work area for possible hazards such as moist floors, ungrounded power extension cables, and missing safety grounds.

Telephone Wiring Guidelines

Use the following guidelines when working with any equipment that is connected to telephone wiring or to other network cabling:

- Never install telephone wiring during a lightning storm.
- Never install telephone jacks in wet locations unless the jack is specifically designed for wet locations.
- Never touch uninsulated telephone wires or terminals unless the telephone line has been disconnected at the network interface.
- Use caution when installing or modifying telephone lines.

Electrostatic Discharge Prevention

Electrostatic discharge (ESD) damages equipment and impairs electrical circuitry. ESD occurs when printed circuit boards are improperly handled and results in complete or intermittent failures.

The network processing engine, I/O controller, port adapters, and Cisco uBR7200 series cable modem cards consist of a printed circuit board that is fixed in a metal carrier. Electromagnetic interference (EMI) shielding, connectors, and a handle are integral components of the carrier. Handle the network processing engine, I/O controller, port adapters, and Cisco uBR7200 series cable modem cards by their carrier edges and handles; never touch the printed circuit board or connector pins.

Figure 7 shows the location of a printed circuit board in a network processing engine, I/O controller, or Cisco uBR7200 series cable modem card metal carrier. Do not touch the printed circuit board when handling any of the components.

Figure 7 Handling the Network Processing Engine, the I/O Controller, and the Cisco uBR7200 Series Cable Modem Cards—Side View

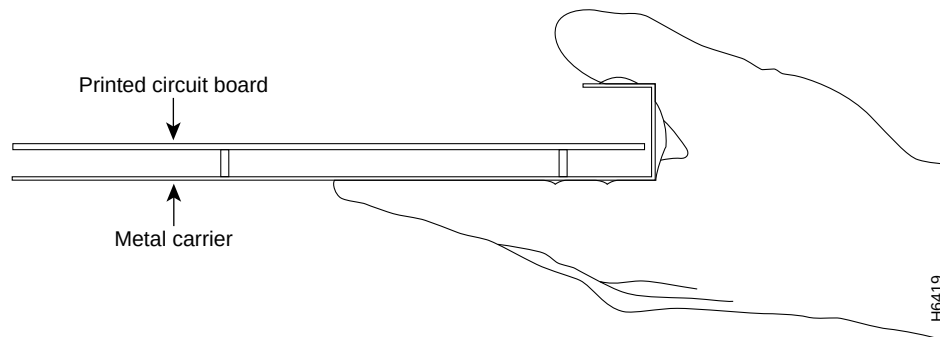
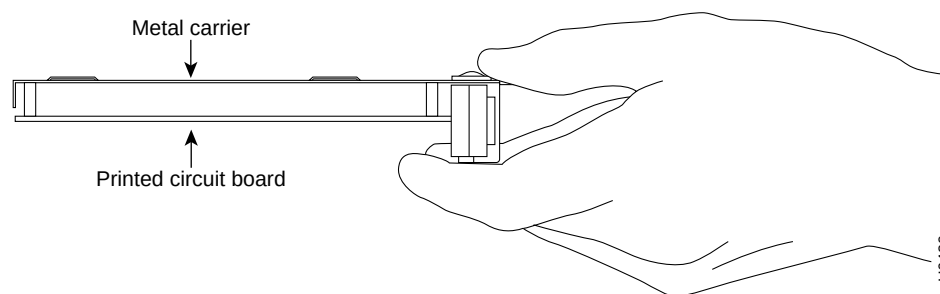


Figure 8 shows the location of a printed circuit board in a port adapter metal carrier. Do not touch the printed circuit board when handling a port adapter.

Figure 8 Handling a Port Adapter—Side View



Although the metal carrier helps to protect the printed circuit boards from ESD, wear a preventive antistatic strap whenever handling the network processing engine, I/O controller, port adapters, or Cisco uBR7200 series cable modem cards. Ensure that the strap makes good skin contact and connect the strap's clip to an unpainted chassis surface to safely channel unwanted ESD voltages to ground.

If no wrist strap is available, ground yourself by touching the metal part of the chassis.



Caution Make sure to tighten the captive installation screws on the network processing engine, Cisco uBR7200 series cable modem cards, and the I/O controller (use a number 2 Phillips or a 3/16-inch, flat-blade screwdriver). These screws prevent accidental removal, provide proper grounding for the router, and help to ensure that the network processing engine, Cisco uBR7200 series cable modem cards, and the I/O controller are properly seated in the router midplane.

Following are guidelines for preventing ESD damage:

- Always use an ESD wrist strap or ankle strap when installing or replacing the network processing engine, I/O controller, port adapters, or Cisco uBR7200 series cable modem cards. Ensure that the ESD strap makes contact with your skin.
- Handle the network processing engine, I/O controller, port adapters, or Cisco uBR7200 series cable modem cards by their metal carrier edges and handles only; avoid touching the printed circuit board components or any connector pins.
- When removing the network processing engine, I/O controller, port adapters, or Cisco uBR7200 series cable modem cards, place them on an antistatic surface with the printed circuit board components facing upward, or in a static shielding bag. If you are returning an I/O controller, network processing engine, port adapter, or Cisco uBR7200 series cable modem card to the factory, immediately place it in a static shielding bag.



Caution Periodically check the resistance value of the antistatic strap. The measurement should be within the range of 1 and 10 megohms.

Removing and Replacing the Input/Output Controller

The following sections explain how to remove and replace an I/O controller in the Cisco 7200 series routers or Cisco uBR7200 series routers:

- 1 Copying the Configuration File to a TFTP Server, page 17
- 2 Powering Down the Router and Disconnecting Input Power, page 19
- 3 Removing the Input/Output Controller, page 24
- 4 Replacing an Input/Output Controller, page 25
- 5 Reconnecting Input Power and Powering Up the Router, page 27
- 6 Downloading the Saved Configuration from the TFTP Server and Configuring the I/O Controller's Fast Ethernet Port, page 33

Note The procedures for removing and replacing an I/O controller in all Cisco 7200 series routers are the same. Therefore, the illustrations and procedures in the following sections apply to the Cisco 7200 VXR routers and the Cisco 7200 routers (including the Cisco 7206 as arouter shelf in the Cisco AS5800 Universal Access Server) unless indicated otherwise.

The procedures for removing and replacing an I/O controller in the Cisco uBR7200 series routers are the same as for the platforms mentioned above; however, to show differences in the chassis and I/O controller location, separate illustrations are provided for the Cisco uBR7200 series routers.

Copying the Configuration File to a TFTP Server

Before you replace the I/O controller, be sure to copy the router's running configuration to a Trivial File Transfer Protocol (TFTP) file server so that you can retrieve it later; otherwise, you will have to reenter your configuration manually.

Before copying the router's configuration file to a TFTP file server, check the following items:

- A console terminal is connected to the console port on the I/O controller, or a Telnet session is established to the router.

- The router is connected to a network supporting a file server (remote host).
- The remote host supports the TFTP application.
- You have the name or address of the remote host.

Complete the following steps to copy the router's configuration file to a remote host:

- Step 1** Make sure you are at the privileged level of the EXEC command interpreter (check the system prompt for a pound sign [#]). If the system prompt does not have a pound sign (#), enter **enable**, and then your password.
- Step 2** Use the **ping** command to check the connection between the router and the remote host.
- Step 3** Enter the **show running-config** command to display the router's running configuration. Ensure that the configuration information is complete and correct. If it is not, use the **configure** command to add or modify the existing configuration. Then enter the **copy running-config startup-config** command to save the retrieved configuration in NVRAM. NVRAM uses lithium batteries to maintain its contents when disconnected from power.

Note Refer to the appropriate software documentation listed in the "If You Need More Information" section on page 2 for descriptions of the configuration options available for the system and individual interfaces, and for specific configuration instructions.

- Step 4** Enter the **copy startup-config tftp** command. The EXEC command interpreter prompts you for the name or IP address of the remote host that is to receive the configuration file. (The prompt might include the name or address of a default file server.)

```
Router# copy startup-config tftp
Remote host []?
```

- Step 5** Enter the name or IP address of the remote host. In the following example, the name of the remote server is *servername*:

```
Router# copy startup-config tftp
Remote host []? servername
Translating "servername"...domain server (1.1.1.1) [OK]
```

- Step 6** The EXEC command interpreter prompts you for the name of the file that will contain the configuration. By default, the system appends *-config* to the router's name to create the new filename. Press **Return** to accept the default filename, or enter a different name for the file before pressing **Return**. In the following example, the default is accepted:

```
Name of configuration file to write [Router-config]?
Write file Router-config on host 1.1.1.1? [confirm]
Writing Router-config.....
```

- Step 7** Before the router executes the copy process, it displays the instructions you entered for confirmation. If the instructions are not correct, enter **n** (no), and then **Return** to stop the process. To accept the instructions, press **Return**, or **y**, and then **Return**; the system begins the copy process. In the following example, the default is accepted:

```
Write file Router-config on host 1.1.1.1? [confirm]
Writing Router-config: !!!! [ok]
```

While the router copies the configuration to the remote host, it displays a series of exclamation points (! ! !) or periods (. . .). The !!!! and [ok] indicate that the operation is successful. A display of . . . [timed out] or [failed] indicates a failure, which would probably be because of a network fault or the lack of a writable, readable file on the remote file server.

Step 8 If the display indicates that the process was successful (with the series of ! ! ! and [ok]), the copy process is complete. The configuration file is safely stored in the temporary file on the remote file server.

If the display indicates that the process failed (with the series of . . . as shown in the following example) your configuration was not saved:

Writing Router-config

Step 9 Repeat the preceding steps, or select a different remote file server and repeat the preceding steps. If you are unable to copy the configuration to a remote host successfully, contact your network administrator or see the end of this document for instructions on contacting technical assistance.

This completes the procedure for copying the configuration file to a TFTP server. Proceed to the section “Powering Down the Router and Disconnecting Input Power.”

Powering Down the Router and Disconnecting Input Power

Complete the steps in the following sections to power down the router and disconnect input power.



Warning This unit might have more than one power cord. To prevent the risk of electric shock, disconnect the two power cords before servicing the unit.

Powering Down the Router

To power down a Cisco 7200 series router or Cisco uBR7200 series router, complete the following steps:

Step 1 Facing the rear of the router, place the power switch on the power supply in the OFF (O) position. Repeat this action if a second power supply is installed in the router.

Step 2 Observe the following items:

- The green OK LED on the power supply turns off.
- The fans stop operating.
- The LEDs on the I/O controller turn off.
- The LEDs on the port adapters turn off.
- On a Cisco uBR7200 series router, the LEDs on the cable modem cards turn off.



Caution When the power switch on a Cisco uBR7200 series power supply is turned to the OFF (O) position, the power supply will enter a reset cycle for ninety (90) seconds. Wait at least ninety (90) seconds before turning the power switch back to the ON (I) position. If you do not wait the full ninety (90) seconds, the power supply will not restart.

This completes the procedure for powering down a Cisco 7200 series router or Cisco uBR7200 series router.

Disconnecting AC-Input Power

To disconnect AC-input power to a Cisco 7200 series router or Cisco uBR7200 series router, complete the following steps:

- Step 1** Unplug the input power cable from the power source.
- Step 2** On a Cisco 7200 series router, push up on the cable-retention clip that secures the input power cable to the router's power supply.

On a Cisco uBR7200 series router, push the cable-retention clip to the left.
- Step 3** Unplug the other end of the input power cable from the power supply. (For a Cisco 7200 series router, see Figure 9. For a Cisco uBR7200 series router, see Figure 10.)

Figure 9 Disconnecting Power from a Cisco 7200 Series AC-Input Power Supply

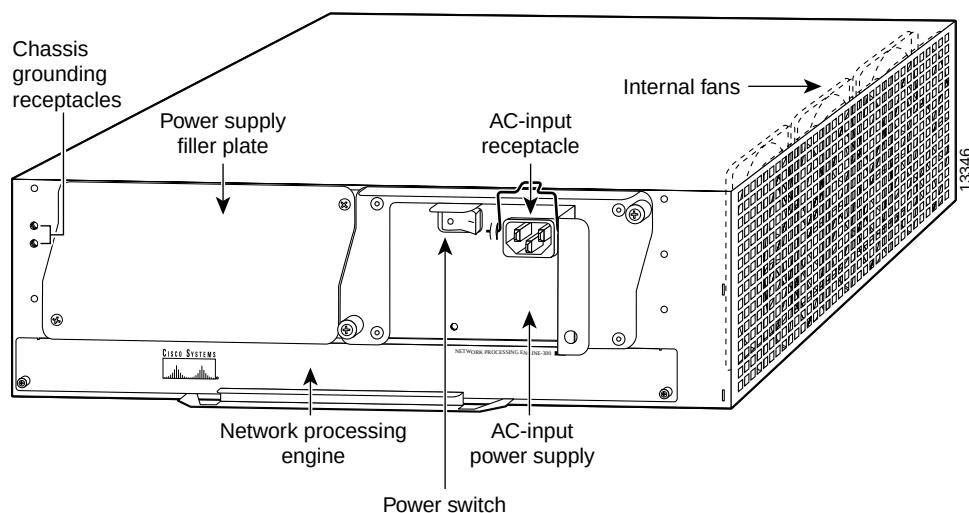
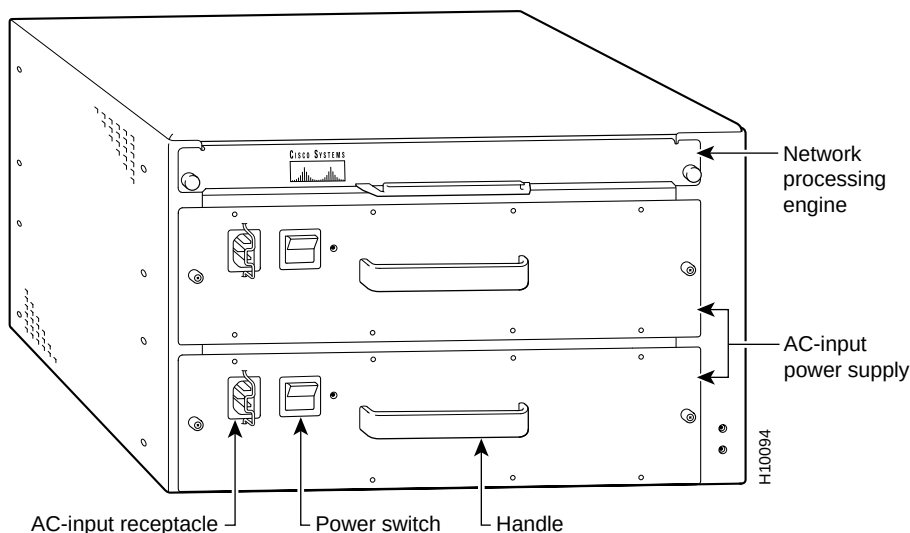


Figure 10 Disconnecting Power from a Cisco uBR7200 Series AC-Input Power Supply (Cisco uBR7246 Shown)



Step 4 Repeat Step 1 through Step 3 if a second power supply is installed.

This completes the procedure for disconnecting AC-input power to Cisco 7200 series router or Cisco uBR7200 series router.

Disconnecting DC-Input Power

To disconnect DC-input power to a Cisco 7200 series router or Cisco uBR7200 series router, complete the following steps:



Warning Before completing any of the following steps, and to prevent short-circuit or shock hazards, ensure that power is removed from the DC circuit. To ensure that all power is OFF, locate the circuit breaker on the panel board that services the DC circuit, switch the circuit breaker to the OFF position, and tape the switch handle of the circuit breaker in the OFF position.



Warning When installing the unit, the ground connection must always be made first and disconnected last.

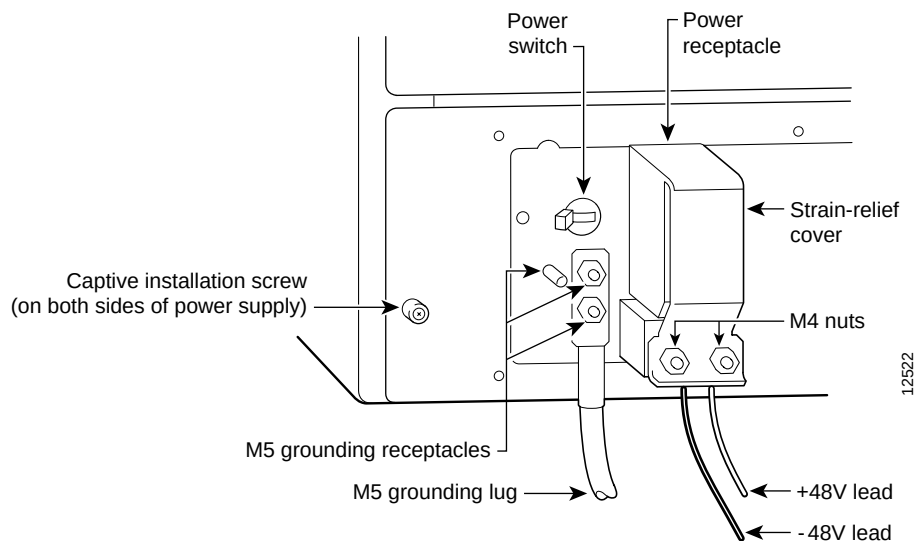
Step 1 Turn OFF the power source and disconnect the –48V and +48V leads from the power source. You can leave the ground cable connected.

Step 2 For a Cisco 7200 series router, remove the cable tie that secures the –48V, +48V, and ground leads to the power supply faceplate. Save the cable tie.

Note The cable tie that accompanied your Cisco 7200 series DC-input power supply can be removed and replaced on the power supply without the use of a tool. If you secured the DC-input power supply leads to the power supply faceplate using a different type of cable tie, use a wire stripper to cut that cable tie from the power supply.

For a Cisco uBR7200 series router, use a 7-mm wrench or nut driver (or adjustable wrench) to loosen and remove the two M4 nuts from the strain-relief cover that secures the –48V and +48V leads to the power supply faceplate. Remove the strain-relief cover. (See Figure 11.)

Figure 11 Removing the Strain-Relief Cover from a Cisco uBR7200 Series DC-Input Power Supply



Step 3 Using a 3/16-inch flat-blade screwdriver, loosen the screw below the +48V lead receptacle, and pull the lead from the connector (For a Cisco 7200 series router, see Figure 12. For a Cisco uBR7200 series router, see Figure 13.)

For Cisco 7200 series routers, repeat this step for the -48V lead and the ground lead.

For Cisco uBR7200 series routers, repeat this step for the –48V lead only. Using an 8-mm wrench or nut driver (or adjustable wrench) loosen and remove the two M5 nuts that secure the two-hole grounding lug to the grounding receptacle, and pull the grounding lug and lead from the receptacle.

Note The color coding of the DC-input power supply leads depends on the color coding of the DC power source at your site. Typically, green or green/yellow is used for ground, black is used for +48V (return), and red or white is used for -48V. Make certain the lead color coding you choose for the DC-input power supply matches lead color coding used at the DC power source.

Figure 12 Disconnecting Power from a Cisco 7200 Series DC-Input Power Supply

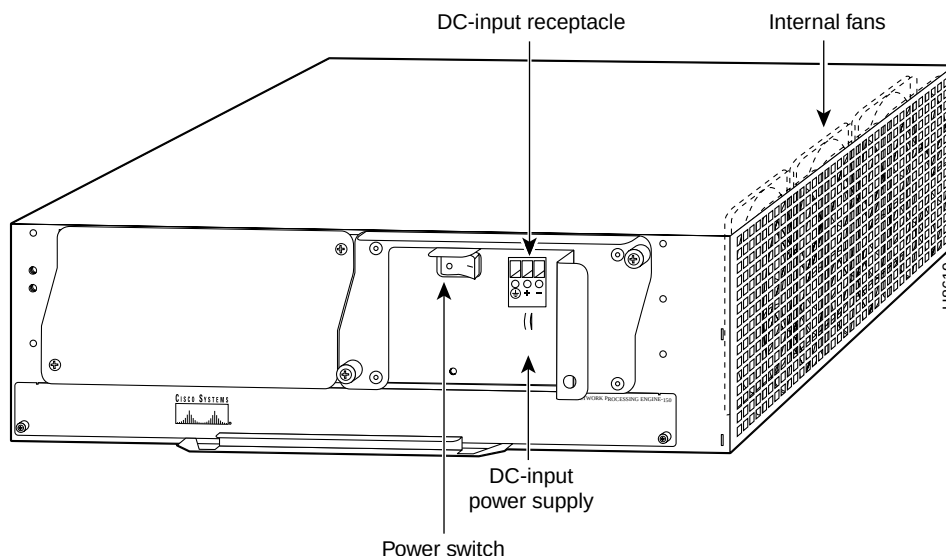
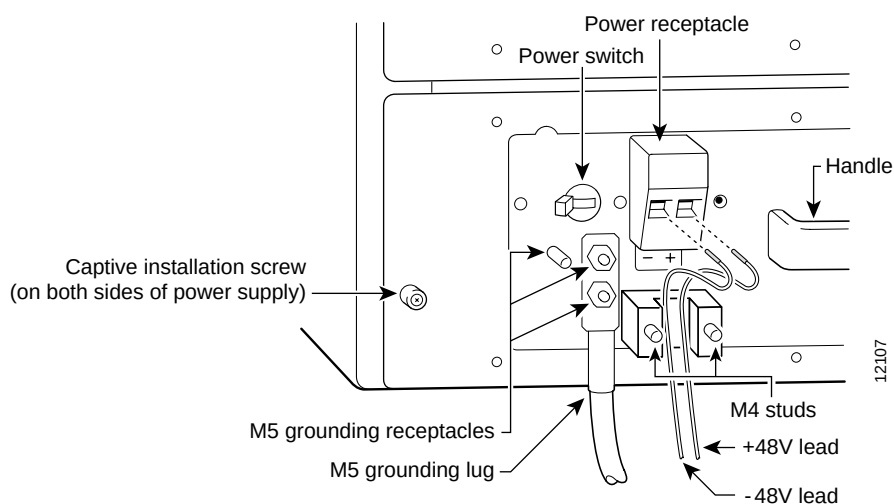


Figure 13 Disconnecting Power from a Cisco uBR7200 Series DC-Input Power Supply



Step 4 Repeat Step 1 through Step 3 if a second power supply is installed.

This completes the procedure for disconnecting DC-input power to a Cisco 7200 series router or Cisco uBR7200 series router.

Removing the Input/Output Controller

To remove an I/O controller from a Cisco 7200 series router or Cisco uBR7200 series router, complete the following steps:

Note Before removing the I/O controller, save the router's configuration to a TFTP file server. (See the "Copying the Configuration File to a TFTP Server" section on page 17.)

- Step 1** Power down the router and disconnect the input power cable. (See the "Powering Down the Router and Disconnecting Input Power" section on page 19.)
- Step 2** Attach an ESD-preventive wrist strap between you and an unfinished chassis surface.
- Step 3** Disconnect the cables from the I/O controller's console, auxiliary, and Fast Ethernet (if present) ports. (For a Cisco 7200 series router, see Figure 14. For a Cisco uBR7200 series router, see Figure 15.)

Figure 14 Cisco 7200 Series Input/Output Controller Ports, Handle, and Captive Screws

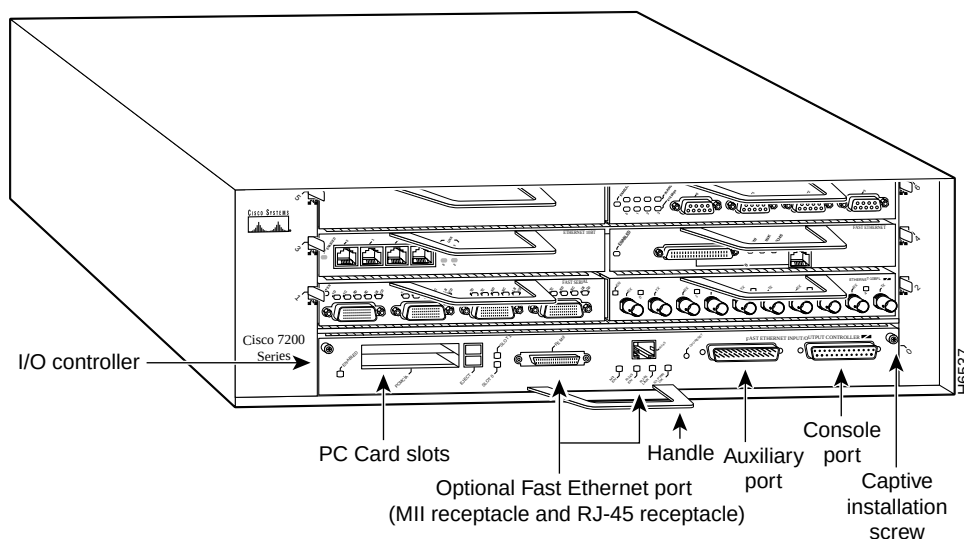
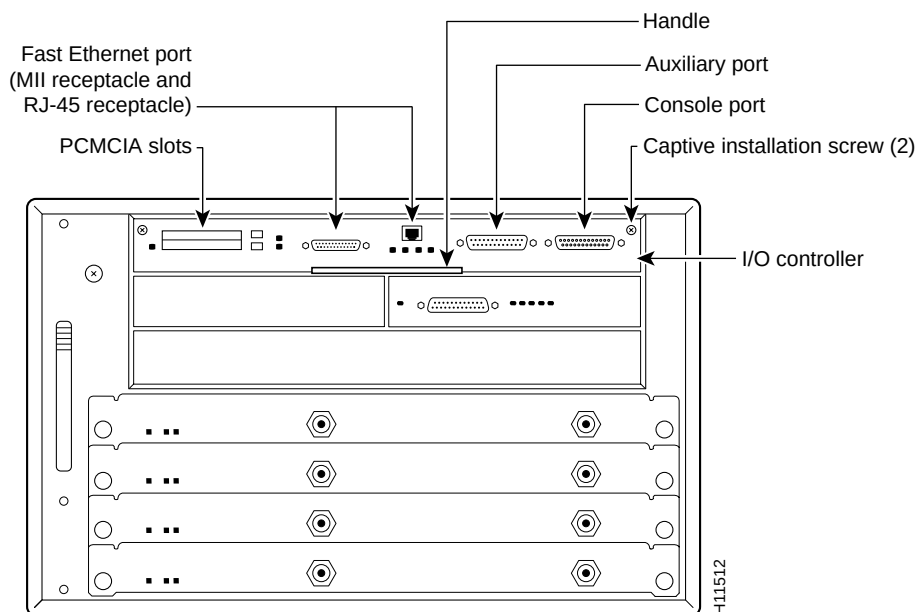


Figure 15 Cisco uBR7200 Series Input/Output Controller Ports, Handle, and Captive Screws (Cisco uBR7246 Shown)



- Step 4** Remove the Flash Disks or Flash memory cards (if present) from the I/O controller's PCMCIA slots. (See the "Installing and Removing a Flash Memory Card" section on page 45.)
- Step 5** Using a number 2 Phillips or a 3/16-inch, flat-blade screwdriver, loosen the two captive installation screws on the faceplate of the I/O controller. (For a Cisco 7200 series router, see Figure 14. For a Cisco uBR7200 series router, see Figure 15.)
- Step 6** Grasp the I/O controller handle and carefully pull the controller from its chassis slot.



Caution Handle the I/O controller by the carrier edges and handle only; never touch the printed circuit board components or connector pins. (See Figure 7.)

- Step 7** Place the I/O controller on an antistatic surface with its components facing upward, or in a static shielding bag. If you are returning the I/O controller to the factory, immediately place it in a static shielding bag.

This completes the procedure for removing an installed I/O controller.

Replacing an Input/Output Controller

To install a new I/O controller in the router, complete the following steps:

- Step 1** Ensure that the router is powered down and its input power cable is disconnected from the router and the power source. (See the "Powering Down the Router and Disconnecting Input Power" section on page 19.)
- Step 2** Attach an ESD-preventive wrist strap between you and an unfinished chassis surface.
- Step 3** Remove the I/O controller from its static shielding bag.

- Step 4** Using both hands, grasp the I/O controller by its metal carrier edges and orient the I/O controller so that its printed circuit board components are upward. (See Figure 7.)



Caution Handle the I/O controller by the carrier edges and handle only; never touch the printed circuit board components or connector pins.

- Step 5** Align the left and right edge of the I/O controller's printed circuit board between the I/O controller slot guides. (For a Cisco 7200 series router, see Figure 16. For a Cisco uBR7200 series router, see Figure 17.)

Figure 16 Aligning the I/O Controller's Printed Circuit Board between the Slot Guides in the Cisco 7200 Series

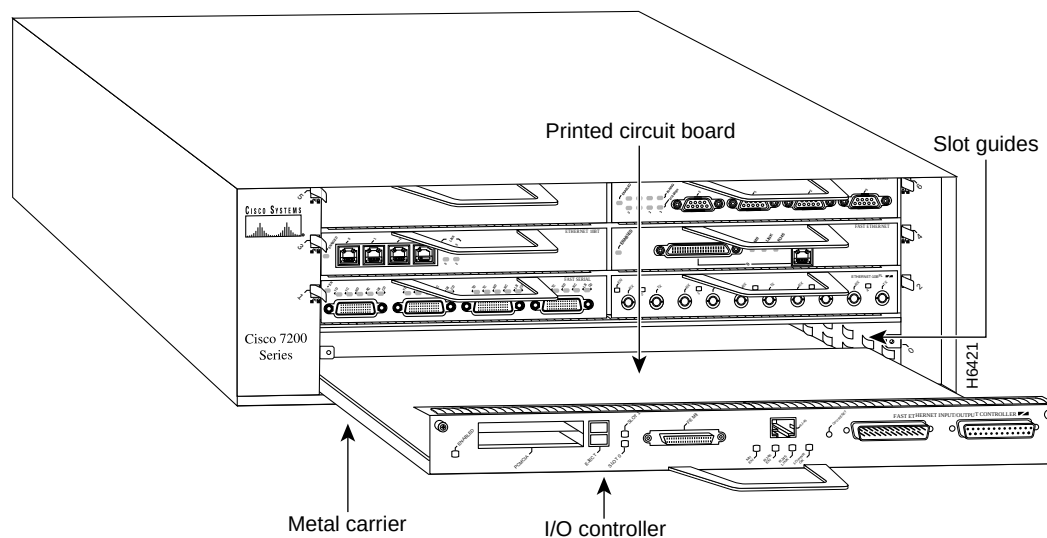
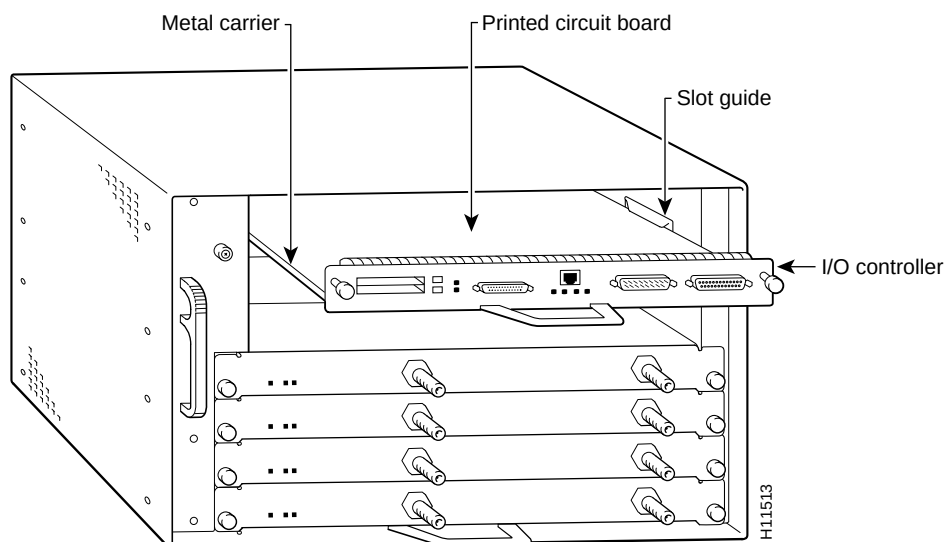


Figure 17 Aligning the I/O Controller's Printed Circuit Board between the Slot Guides in the Cisco uBR7200 Series (Cisco uBR7246 Shown)





Caution Do not align the I/O controller's *metal carrier* between the slot guides. Doing so will damage components on the I/O controller's printed circuit board as you slide the I/O controller into its chassis slot.

Step 6 Gently slide the I/O controller all the way into its chassis slot until you feel the connectors make contact with the router midplane.

Step 7 Seat the I/O controller in the router midplane by tightening its captive installation screws with a number 2 Phillips or a 3/16-inch, flat-blade screwdriver.

Note The I/O controller is not fully seated in the router midplane until you tighten its captive installation screws (use a number 2 Phillips or a 3/16-inch flat-blade screwdriver).

Step 8 Connect the cables to the I/O controller's console, auxiliary, and Fast Ethernet (if present) ports. (For a Cisco 7200 series router, see Figure 14. For a Cisco uBR7200 series router, see Figure 15.) (See the "I/O Controller Connection Equipment and Port Signaling" section on page 39.)

Step 9 Replace Flash Disks or Flash memory cards (if present) in the PCMCIA slots. (See the "Installing and Removing a Flash Memory Card" section on page 45.)

This completes the procedure for replacing the I/O controller in a Cisco 7200 series router or Cisco uBR7200 series router.

Reconnecting Input Power and Powering Up the Router

The following procedures explain how to reconnect input power to a Cisco 7200 series router or Cisco uBR7200 series router, power up the router, and verify a successful system boot.



Warning Read the installation instructions before you connect the system to its power source.

Reconnecting AC-Input Power

To reconnect AC-input power to a Cisco 7200 series router or Cisco uBR7200 series router, complete the following steps:

Step 1 At the rear of the router, check that the power switch on the power supply is in the OFF (O) position.

Step 2 Slide the cable-retention clip up (Cisco 7200 series) or to the left (Cisco uBR7200 series), away from the AC receptacle, and plug in the power cable.

Step 3 Secure the cable in the power supply AC receptacle by sliding the cable-retention clip down (Cisco 7200 series) or to the right (Cisco uBR7200 series), until it snaps around the connector. The cable-retention clip provides strain relief for the AC power cable. (For a Cisco 7200 series router, see Figure 18. For a Cisco uBR7200 series router, see Figure 19.)

Figure 18 Connecting AC-Input Power to a Cisco 7200 Series Router

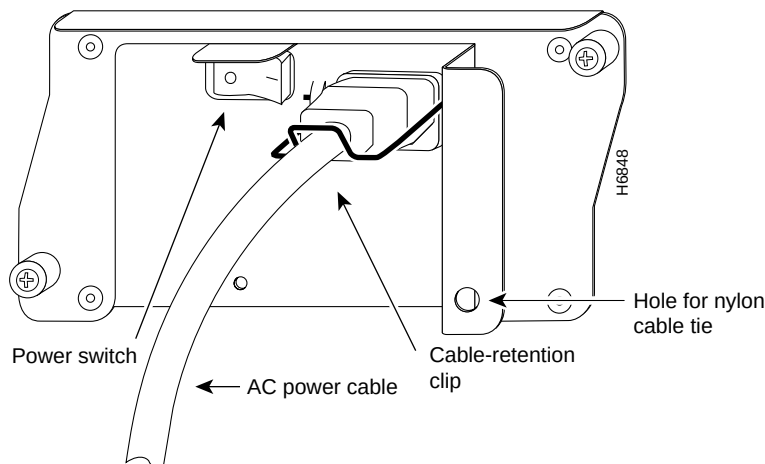
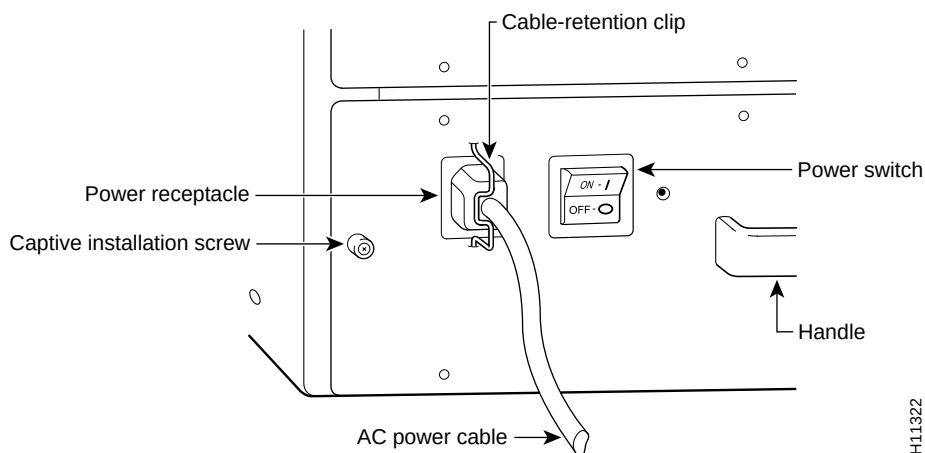


Figure 19 Connecting AC-Input Power to a Cisco uBR7200 Series Universal Broadband Router



Step 4 Plug the AC power supply cable into the AC power source.

Note For the Cisco 7200 series routers, each AC-input power supply operating at 120 VAC requires a minimum of 5A service.

For the Cisco uBR7200 series routers, each AC-input power supply operating at 120 VAC requires a minimum of 7A service.

We recommend powering Cisco 7200 series routers, and the Cisco uBR7200 series routers from a 120 VAC, 15A receptacle U.S. (240 VAC, 10A international) at the power source.

Step 5 Repeat Step 1 through Step 4 if a second power supply is installed.

This completes the steps for reconnecting AC-input power to a Cisco 7200 series router or Cisco uBR7200 series router. Proceed to the “Powering Up the Router” section on page 32.

Reconnecting DC-Input Power

To reconnect DC-input power to a Cisco 7200 series router or Cisco uBR7200 series router, complete the following steps:

Note The color coding of the DC-input power supply leads depends on the color coding of the DC power source at your site. Typically, green or green/yellow is used for ground, black is used for +48V (return), and red or white is used for –48V. Make certain the lead color coding you choose for the DC-input power supply matches the lead color coding used at the DC power source.



Warning Before completing any of the following steps, and to prevent short-circuit or shock hazards, ensure that power is removed from the DC circuit. To ensure that all power is OFF, locate the circuit breaker on the panel board that services the DC circuit, switch the circuit breaker to the OFF position, and tape the switch handle of the circuit breaker in the OFF position.



Warning When installing the unit, the ground connection must always be made first and disconnected last.

Step 1 Ensure that the –48V and +48V leads are disconnected from the power source.

Step 2 At the rear of the router, check that the power switch on the power supply is in the OFF (O) position. (For a Cisco 7200 series router, see Figure 20. For a Cisco uBR7200 series router, see Figure 21.)

Figure 20 Connecting DC-Input Power to a Cisco 7200 Series Router

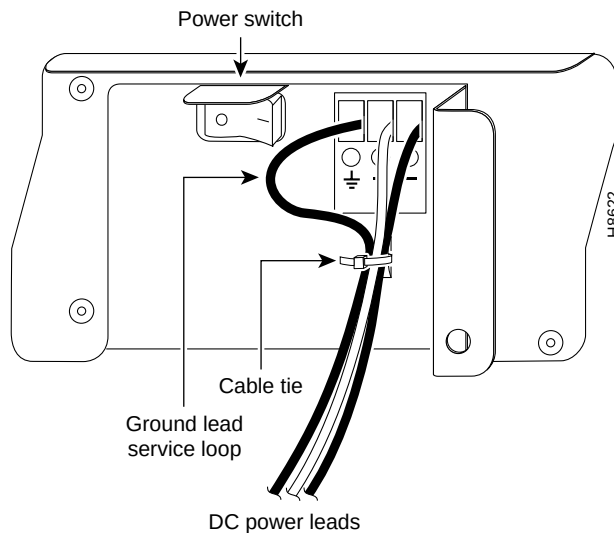
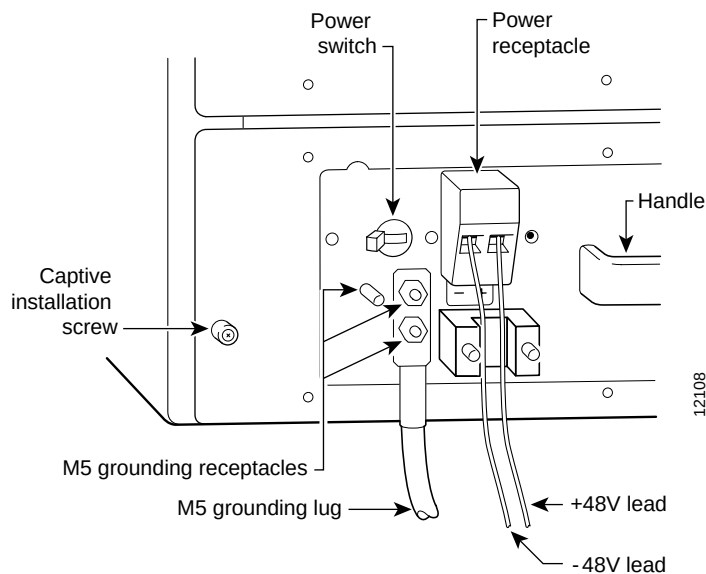
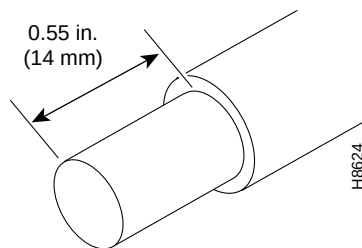


Figure 21 Connecting DC-Input Power to a Cisco uBR7200 Series Universal Broadband Router



Step 3 If necessary, use a wire stripper to strip approximately 0.55 inch (14 mm) from the –48V, +48V, and ground leads. (See Figure 22.)

Figure 22 Stripping the DC-Input Leads



Note The ground lead for a Cisco uBR7200 series DC-input power supply consists of a two-hole grounding lug that connects to an M5 grounding receptacle; you do not need to strip this ground lead.

Step 4 For a Cisco 7200 series router, insert the stripped end of the ground lead all the way into the ground lead receptacle on the DC-input power supply, and tighten the receptacle screw using a 3/16-inch flat-blade screwdriver. (See Figure 20.)

For a Cisco uBR7200 series router, connect the two-hole grounding lug on the grounding lead to the M5 grounding receptacles with the M5 nuts. Tighten the nuts using the 8-mm wrench or nut driver (or adjustable wrench). (See Figure 21.)

Step 5 Insert the stripped end of the +48V lead all the way into the +48V lead receptacle and tighten the receptacle screw using the same 3/16-inch flat-blade screwdriver. Repeat Step 5 for the –48V lead.

Note Make sure the entire stripped end of each lead is inserted all the way into its receptacle. If any exposed wire at the stripped end of a lead is visible after inserting the lead into its receptacle, remove the lead from the receptacle, use the wire stripper to cut the stripped end of the lead, and repeat Step 3 through Step 5.

Step 6 After tightening the receptacle screw or nuts for the ground, +48V, and –48V DC-input leads, secure the leads to the power supply faceplate. For the Cisco 7200 series, use the cable tie you saved earlier in this procedure to secure the three leads.

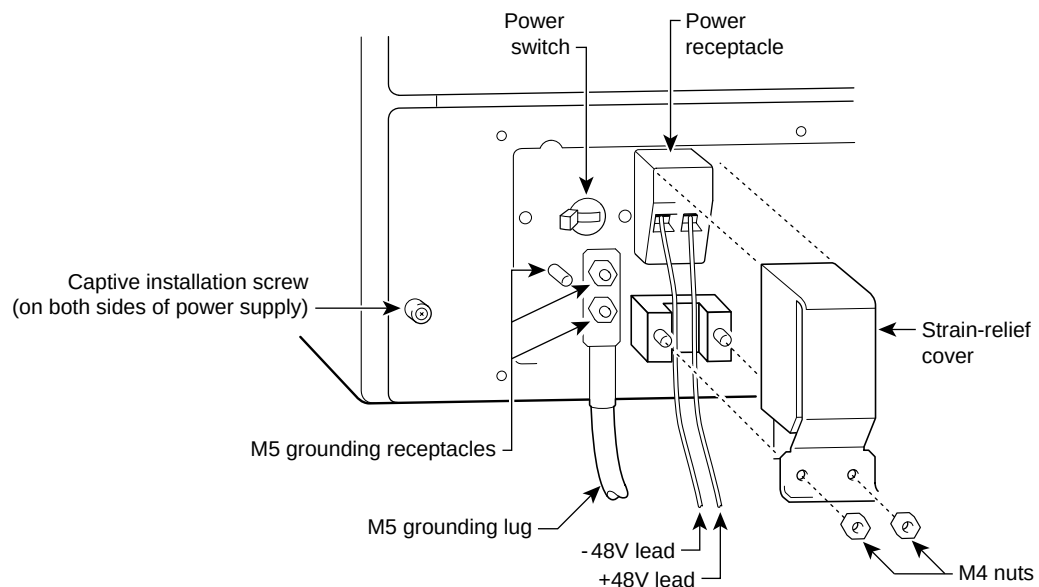
For the Cisco uBR7200 series, run the +48V and –48V leads between the two strain-relief studs on the power supply faceplate. (See Figure 21.)

Note For the Cisco 7200 series routers, when securing the ground, +48V, and –48V DC-input leads to the power supply faceplate, leave a small service loop in the ground lead to ensure that it is the last lead to disconnect from the power supply if a great deal of strain is placed on all three leads. (See Figure 20.)

A service loop is not required in the lead attached to the grounding lug on the Cisco uBR7200 series router because this lead is separate from the +48V and –48V leads and is secured by two M5 nuts to the M5 receptacles.

Step 7 For a Cisco uBR7200 series router, replace the strain-relief cover over the +48V and –48V leads and secure the cover to the strain-relief studs using the two M4 nuts with the 7-mm wrench or nut driver (or adjustable wrench). (See Figure 23.)

Figure 23 Replacing the Strain-Relief Cover on a Cisco uBR7200 Series DC-Input Power Supply



Step 8 Connect the ground, +48V, and –48V leads to the power source.

Note For the Cisco 7200 series, each DC-input power supply operating at –48 VDC in North America requires a minimum of 13A service. Each DC-input power supply operating at –60 VDC in the European Community requires a minimum of 8A service.

For the Cisco uBR7200 series routers, each DC-input power supply rating is 14A, 700 volt ampere (VA).

This product relies on the building's installation for short-circuit (overcurrent) protection. Ensure that a listed and certified fuse or circuit breaker, 35A minimum 60 VDC, is used on all current carrying conductors.

Step 9 Repeat Step 1 through Step 8 if a second power supply is installed.

This completes the steps for reconnecting DC-input power to a Cisco 7200 series router or Cisco uBR7200 series router.

Powering Up the Router

To power up a Cisco 7200 series or Cisco uBR7200 series router that has an installed AC-input or DC-input power supply, complete the following steps:

Step 1 Check for the following:

- Each port adapter is inserted in its slot, and its respective port adapter lever is in the locked position.
- The network processing engine and the I/O controller are inserted in their respective slots, and their captive installation screws are tightened.
- All network interface cables are connected to the port adapters.
- Each cable modem card is inserted in its slot, and its respective captive installation screws are tightened (Cisco uBR7200 series only).
- A Flash memory card is installed in its PCMCIA slot (if present).
- Each AC-input power cable is connected and secured with the cable-retention clip (AC-input power supplies only).
- For a Cisco 7200 series router, each DC lead is connected and secured to the power supply faceplate with a cable tie; for a Cisco uBR7200 series router, each DC lead is connected with M5 nuts for the grounding receptacle and the strain-relief cover over the +48V and –48V leads (DC-input power supplies only).
- Each DC lead is connected and secured to the power source (DC-input power supplies only).
- Ensure the tape (that you applied earlier) is removed from the circuit breaker switch handle, and power is restored by moving the circuit breaker handle to the ON (I) position (DC-input power supplies only).
- The console terminal is turned on.



Caution When the power switch on a Cisco uBR7200 series power supply is turned to the OFF (O) position, the power supply will enter a reset cycle for ninety (90) seconds. Wait at least ninety (90) seconds before turning the power switch back to the ON (I) position. If you do not wait the full ninety (90) seconds, the power supply will not restart.

- Step 2** At the rear of the router, place the power switch on the power supply in the ON (I) position. Repeat this step if a second power supply is installed in the router. The green OK LED on the power supply turns on.
- Step 3** Listen for the fans; you should immediately hear them operating.
- Step 4** During the boot process, observe the system's LEDs. The LEDs on most of the port adapters and Cisco uBR7200 series cable modem cards go on and off in irregular sequence. Some may go on, go out, and go on again for a short time. On the I/O controller, the IO power OK LED comes on immediately.
- Step 5** Observe the initialization process. When the system boot is complete (a few seconds), the network processing engine begins to initialize the port adapters, Cisco uBR7200 series cable modem cards, and the I/O controller. During this initialization, the LEDs on each port adapter behave differently (most flash on and off). The enabled LED on each port adapter and Cisco uBR7200 series cable modem card goes on when initialization is completed, and the console screen displays a script and system banner similar to the following:

```
Cisco Internetwork Operating System Software
IOS (tm) 7200 Software (C7200-J-M), Version 11.1(9) [kpfjrgiu 100]
Copyright (c) 1986-1996 by cisco Systems, Inc.
Compiled Sun 21-Apr-96 04:10 by
```

This completes the procedures for connecting input power and powering up the router.

Downloading the Saved Configuration from the TFTP Server and Configuring the I/O Controller's Fast Ethernet Port

After you install a new I/O controller in the router and verify a successful router boot, you must retrieve the router's configuration from the TFTP server and copy it to NVRAM. Use the **copy tftp running-config command** to copy the saved configuration from the TFTP file server. The system prompts you for a host name and address, the name of the configuration file stored on the host, and confirmation to reboot using the remote file.

If you replaced an I/O controller without the Fast Ethernet port with an I/O controller with the Fast Ethernet port, you will most likely want to configure the new interface after retrieving the router's configuration from the TFTP server and copying it to NVRAM.

Before retrieving the router's configuration file from the TFTP file server, check the following:

- A console terminal is connected to the console port on the I/O controller, or a Telnet session is established to the router
- The router is connected to a network supporting a file server (remote host)
- The remote host supports the TFTP application
- You have the name or address of the remote host

Before configuring the new interface on the I/O controller, be prepared with the following information:

- Protocols and encapsulations you plan to use on the new interface
- Protocol specific information, such as Internet Protocol (IP) addresses if you will configure the interface for IP routing

For complete descriptions of interface commands and the configuration options available for Cisco 7200 series and Cisco uBR7200 series-related interfaces, refer to the documentation resources listed in the “If You Need More Information” section on page 2.

Downloading the Saved Configuration from the TFTP Server

To retrieve the saved router configuration from the remote host, complete the following steps:

- Step 1** Make sure you are at the privileged level of the EXEC command interpreter (check the system prompt for a pound sign [#]). If the system prompt does not have a pound sign (#), enter **enable**, and then your password.

Note Until you retrieve the saved configuration, the router will be running from the default configuration in NVRAM. Therefore, any passwords that were previously configured on the system will not be valid until you retrieve the configuration.

- Step 2** Use the **ping** command to check the connection between the router and the remote host.

- Step 3** At the system prompt, issue the **copy tftp running-config** command and press **Return** to enter configuration mode. Specify that you will configure the system from a network device (instead of from the console terminal, which is the default).

```
Router# copy tftp running-config
```

- Step 4** The system prompts you to select a host or network configuration file. The default is host; press **Return** to accept the default.

```
Host or network configuration file [host]?
```

- Step 5** The system prompts you for the IP address of the host. Enter the IP address or name of the remote host (the remote file server to which you copied the configuration file).

```
IP address of remote host [255.255.255.255]? 1.1.1.1
```

- Step 6** The system prompts you for the name of the configuration file. When copying the file to the server, the default is to use the name of the router with the suffix *-config* (*router-config* in the following example). If you specified a different filename when you copied the configuration, enter that filename; otherwise, press **Return** to accept the default.

```
Name of configuration file [router-config]?
```

- Step 7** Before the system reboots with the new configuration, it displays the instructions you entered for confirmation. If the instructions are not correct, enter **n** (no), then press **Return** to cancel the process. To accept the instructions, press **Return**, or **y**, and then **Return**.

```
Configure using router-config from 1.1.1.1? [confirm]
Booting router-config from 1.1.1.1: ! ! [OK - 874/16000 bytes]
```

While the router retrieves and boots from the configuration on the remote host, the console display indicates whether or not the operation was successful. A series of !!!! and [OK] (as shown in the preceding example) indicates that the operation was successful. A series of . . . and [timed out] or [failed] indicate a failure (which would probably be due to a network fault or an incorrect server name, address, or filename). The following is an example of a failed attempt to boot from a remote server:

```
Booting Router-config . . . . . [timed out]
```

If the display indicates that the process was successful, proceed to the next step.

If the display indicates that the process failed, verify the name or address of the remote server and the filename, and repeat the preceding steps. If you are unable to retrieve the configuration, contact your network administrator or see the end of this document for instructions on contacting Cisco technical assistance.

- Step 8** Issue the **show running-config** command to display the currently running configuration on the terminal. Review the display and ensure that the configuration information is complete and correct. If it is not, verify the filename and repeat the preceding steps to retrieve the correct file, or use the **configure** command to add or modify the existing configuration. (Refer to the appropriate software documentation for descriptions of the configuration options available for the system and individual interfaces and specific configuration instructions.)
- Step 9** When you have verified that the currently running configuration is correct, issue the **copy running-config startup-config** command to save the retrieved configuration in NVRAM. Otherwise, the new configuration will be lost when you restart the system.

This completes the procedure for downloading the saved router configuration from the remote host. Proceed to the following section “Configuring the I/O Controller’s Fast Ethernet Port” if you installed an I/O controller with the Fast Ethernet port. If you installed an I/O controller without the Fast Ethernet port, this completes the procedure for replacing the I/O controller in a Cisco 7200 series router or Cisco uBR7200 series router. Proceed to the “Additional Information” section on page 39 for additional information you might need when replacing an I/O controller in a Cisco 7200 series router or Cisco uBR7200 series router.

Configuring the I/O Controller's Fast Ethernet Port

The following procedure explains a basic configuration for the Fast Ethernet port on the I/O controller. In the following procedure, press the **Return** key after each step unless otherwise noted. At any time you can exit the privileged level and return to the user level by entering **disable** at the prompt as follows:

```
Router# disable
```

```
Router>
```

Note You can install an I/O controller with or without a Fast Ethernet port in the Cisco 7200 series routers (including a Cisco 7206 as a router shelf in a Cisco AS5800 Universal Access Server); however, when you install an I/O controller with a Fast Ethernet port in a Cisco 7202, the system software automatically disables the port. Therefore, the steps in this section that explain how to configure the I/O controller’s Fast Ethernet port do not apply to a Cisco 7202 that has an installed I/O controller with a Fast Ethernet port.

Note The Cisco 7200 series routers and Cisco uBR7200 series routers identify interfaces by port adapter slot number and interface port number. Port adapter slot 0 in the Cisco 7200 series routers and Cisco uBR7200 series routers is always reserved for the Fast Ethernet port on the I/O controller. Therefore, the address of the Fast Ethernet port on the I/O controller (if present) in Cisco 7200 series routers or Cisco uBR7200 series routers is always 0/0.

The Cisco 7206 router shelf identifies interfaces by shelf number, port adapter slot number, and interface port number. The shelf number is a number assigned to the router shelf during the initial configuration of the Cisco AS5800 Universal Access Server. Port adapter slot 0 in the Cisco 7206 router shelf is also reserved for the Fast Ethernet port on the I/O controller. Therefore, the address of the Fast Ethernet port on the I/O controller (if present) in a router shelf is *x/0/0*, where *x* is the shelf number. For information about the Cisco 7206 as a router shelf in a Cisco AS5800 Universal Access Server, refer to the Cisco AS5800 Universal Access Server documentation listed in the “If You Need More Information” section on page 2.

- Step 1** At the privileged-level prompt, enter configuration mode and specify that the console terminal will be the source of the configuration subcommands as follows:

```
Router# configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#
```

- Step 2** Specify the Fast Ethernet port on the I/O controller interface to configure by entering the **interface fastethernet 0/0** command as follows:

```
Router(config)# interface fastethernet 0/0
```

Note In a Cisco 7206 router shelf, the interface specified in Step 2 would include a shelf number. For example, the command **interface fastethernet 5/0/0** would specify the Fast Ethernet interface on the I/O controller (slot 0) in router shelf 5.

- Step 3** If IP routing is enabled on the system, assign an IP address and subnet mask to the interface with the **ip address** subcommand as follows:

```
Router(config-if)# ip address 1.1.1.10 255.255.255.0
```

- Step 4** If you installed an I/O controller with the Fast Ethernet port that is equipped with an MII receptacle and an RJ-45 receptacle, use the **media-type** command to specify the I/O controller's media type; the default is the RJ-45 receptacle. The following example configures the MII receptacle as the media type for the I/O controller:

```
Router(config-if)# media-type mii
```

Note Use the **media-type 100BaseFX** command to return the media type to the RJ-45 receptacle.

- Step 5** Use the **full-duplex** command to specify full-duplex transmission mode for the Fast Ethernet port on the I/O controller; the default is half-duplex mode. The following example configures full-duplex mode:

```
Router(config-if)# full-duplex
```

Note Use the **no full-duplex** command to return the Fast Ethernet port on the I/O controller to half-duplex mode.

- Step 6** Change the shutdown state to up and return to configuration mode to enable the interface as follows:

```
Router(config-if)# no shutdown
Router(config-if)# exit
Router(config)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed
state to up
%LINK-3-UPDOWN: Interface FastEthernet0/0, changed state to up
```

- Step 7** Press **Ctrl-Z** (hold down the **Control** key while you press **Z**) or enter **end** to exit configuration mode and return to the EXEC command interpreter prompt as follows:

```
Router(config)#
Ctrl-Z
Router#
```

- Step 8** Write the new configuration to nonvolatile memory as follows:

```
Router# copy running-config startup-config
[OK]
Router#
```

- Step 9** Use the **show interfaces** command to verify that the interface and line protocol are in the correct state (up) and the correct media type (MII or RJ-45) and transmission mode (half-duplex or full-duplex) are configured on the interface. The following example shows the I/O controller's Fast Ethernet interface and line protocol are up, the media type is RJ-45 (shown below as 100BaseTX), and the transmission mode is full-duplex (shown below as fdx):

```
Router# sh interface fastethernet 0/0
FastEthernet0/0 is administratively up, line protocol is up

(display text omitted)

Encapsulation ARPA, loopback not set, keepalive not set, fdx, 100BaseTX

(display text omitted)
```

Note In a Cisco 7206 router shelf, the interface specified in this step would include a shelf number.

This completes the procedure for a basic configuration of the Fast Ethernet port on the I/O controller.

Troubleshooting Using the show interfaces fastethernet Command

Intel Corporation recently changed the specifications for its Peripheral Component Interconnect (PCI) Fast Ethernet hardware interface. These changes have been incorporated into certain Cisco hardware products. For most users, this change is transparent. However, an anomaly has been identified when this updated Cisco hardware is used in conjunction with certain releases of Cisco IOS software. This section explains the anomaly and how to work around it.

Anomaly Details

When you use the Cisco IOS software **show interfaces fastethernet** command, the following output is normally displayed:

```
Router# show interfaces fastethernet [slot/port]

FastEthernet0/0 is up, line protocol is up
Hardware is DEC21140, address is 00e0.f74f.dc00 (bia 00e0.f74f.dc00)
Internet address is 192.168.255.1
MTU 1500 bytes, BW 100000 Kbit, DLY 100 usec, rely 255/255, load 1/255
Encapsulation ARPA, loopback not set
Keepalive set (10 sec)
Half-duplex, 100Mb/s, MII
ARP type: ARPA, ARP Timeout 04:00:00
Last input never, output 00:00:06, output hang never
Last clearing of "show interface" counters never
Queueing strategy: fifo
Output queue 0/40, 0 drops; input queue 0/75, 0 drops
5 minute input rate 0 bits/sec, 0 packets/sec
5 minute output rate 1000 bits/sec, 0 packets/sec
0 packets input, 0 bytes
Received 0 broadcasts, 0 runts, 0 giants, 0 throttles
0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored
0 watchdog, 0 multicast
0 input packets with dribble condition detected
51 packets output, 11872 bytes, 0 underruns
0 output errors, 0 collisions, 3 interface resets
0 babbles, 0 late collision, 0 deferred
0 lost carrier, 0 no carrier
0 output buffer failures, 0 output buffers swapped out
```

When you enter this command using Cisco IOS Release 11.1(10) or older, or Release 11.2(4) or older with updated Cisco hardware, the “overrun” field (shown in **bold** in the output above) is always zero.

If you use this command because you are troubleshooting potential network problems, you may be expecting to see a number in the overrun field.

Anomaly Workaround

To work around this problem, issue one of the following Cisco IOS software commands to obtain an overrun value. The command is different for each supported platform:

- Cisco 7500 series routers — Access the VIP console where the affected hardware resides and issue the following command:

```
Router# if-con c
```

- Cisco 7200 series routers — Issue the following command:

```
Router# show controller fastethernet FE-slot number/0
```

The following output is normally displayed:

```
Hardware is DEC21140
dec21140_ds=0x603531A0, registers=0x4D800000, ib=0x300612C0
rx ring entries=64, tx ring entries=128
rxring=0x300613C0, rxr shadow=0x603532C0, rx_head=5, rx_tail=0
txring=0x30061800, txr shadow=0x60353400, tx_head=33, tx_tail=33, tx_count=0
PHY link up
Far End Fault Indication (For FX Interface): OFF
CSR0=0xFE02E080, CSR3=0x300613C0, CSR4=0x30061800, CSR5=0xFC660000
CSR6=0x320CA002, CSR7=0xFFFFA261, CSR8=0xE0400000, CSR9=0xFFDC3FF
CSR11=0xFFFE0000, CSR12=0xFFFFF09, CSR15=0xFFFFFEC8
DEC21140 PCI registers:
bus_no=2, device_no=0
CFID=0x00091011, CFCS=0x22800006, CFRV=0x02000022, CFLT=0x0000FF00
CBIO=0x08312001, CBMA=0x01800000, CFIT=0x28140100, CFDA=0x00000000
MII registers:
Register 0x00:  2000  784F  2000  5C01  0081  0000  0000  0000
Register 0x08:  0000  0000  0000  0000  0000  0000  0000  0000
Register 0x10:  0000  0000  0000  0009         0000  0001  8060
Register 0x18:  8020  0820  0000  3800  A3B9
:
<additional information omitted>
:
```

The field that determines overrun is “CSR8” (shown in bold in the output above). This field is in hexadecimal format. To determine an overrun value, take the first four (high-order) digits, drop the first one from the left, convert the remaining three digits to the decimal equivalent, and then divide that number in half.

In the example above, there are overflows recorded in CSR8=0xE0400000. To determine the overflow value from this example, take the first four (high-order) digits (E040), drop the first digit (E), and convert the remaining number (040) to the decimal equivalent (64). Then divide that number in half. The overrun value in this example is 32.

Additional Information

This section includes additional information that you might need when replacing an I/O controller in a Cisco 7200 series router or Cisco uBR7200 series router.

I/O Controller Connection Equipment and Port Signaling

This section contains connection equipment and pinout information for the console, auxiliary, and Fast Ethernet ports on the I/O controller.

Note You can install an I/O controller with or without a Fast Ethernet port in the Cisco 7200 series routers (including a Cisco 7206 as a router shelf in a Cisco AS5800 Universal Access Server); however, when you install an I/O controller with a Fast Ethernet port in a Cisco 7202, the system software automatically disables the port. Therefore, the Fast Ethernet port connection equipment and pinout information in this section does not apply to a Cisco 7202 that has an installed I/O controller with a Fast Ethernet port.

Fast Ethernet MII Connection Equipment

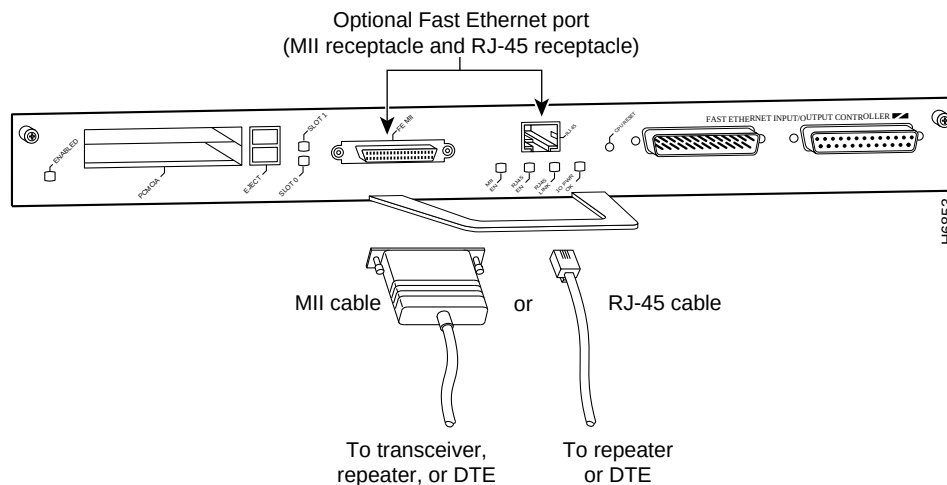
The MII receptacle on the I/O controller is a 40-pin, D-shell type connector that is configurable for 100 megabits per second (Mbps). The MII receptacle supports IEEE 802.3u interfaces compliant with the 100BASE-X and 100BASE-T standards. The MII connection requires an external transceiver that permits connection to multimode fiber for 100BASE-FX or 100BASE-T4 physical media. (See Figure 24.)



Caution Before connecting the transceiver to the MII receptacle on the I/O controller, check the MII transceiver's documentation (or with the transceiver's manufacturer) to ensure the transceiver responds to physical sublayer (PHY) address 0; otherwise, anomalies with the MII connection on the I/O controller might occur. (PHY address 0 is defined in the section 22.2.4.4 "PHY Address" of the IEEE 802.3u specification.) If present, we recommend using the transceiver's "Isolation Mode" setting if you are unable to determine if the transceiver responds to physical sublayer (PHY) address 0.

Note To determine if an MII transceiver that is already connected to the MII receptacle on the I/O controller responds to PHY address 0, ensure the I/O controller's Fast Ethernet port is configured as up and the MII receptacle is configured as the media type, then disconnect the transceiver from the MII receptacle. If the Fast Ethernet port goes down, the transceiver responds to PHY address 0.

Figure 24 Fast Ethernet Port Connection



Depending on the type of media you use between the MII connection and your switch or hub, the network side of your 100BASE-T transceiver should be appropriately equipped with ST-type connectors (for optical fiber), BNC connectors, and so forth.

Figure 25 shows the pin orientation of the MII receptacle on the I/O controller.

The MII receptacle uses 2-56 screw-type locks, called jackscrews, to secure the cable or transceiver to the receptacle. MII cables and transceivers have knurled thumbscrews that you fasten to the jackscrews on the MII receptacle and tighten with your fingers. Use the jackscrews to secure your MII cable to the MII receptacle.

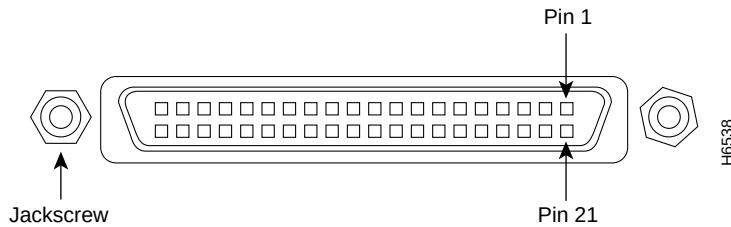
Figure 25 MII Receptacle

Table 6 lists the pinouts and signals for the I/O controller MII receptacle.

Table 6 MII Receptacle Pinout

Pin ¹	In	Out	I/O	Description
14–17	–	Yes	–	Transmit Data (TxD)
12	Yes	–	–	Transmit Clock (Exactly) ²
11	–	Yes	–	Transmit Error (Tx_ER)
13	–	Yes	–	Transmit Enable (Tx_EN)
3	–	Yes	–	MII Data Clock (MDC)
4–7	Yes	–	–	Receive Data (RxD)
9	Yes	–	–	Receive Clock (Rx_CLK)
10	Yes	–	–	Receive Error (Rx_ER)
8	Yes	–	–	Receive Data Valid (Rx_DV)
18	Yes	–	–	Collision (COL)
19	Yes	–	–	Carrier Sense (CRS)
2	–	–	Yes	MII Data Input/Output (MDIO)
22–39	–	–	–	Common (ground)
1, 20, 21, 40	–	–	–	+5.0 volts (V)

¹ Any pins not indicated are not used.

² Exactly and Rx_CLK are provided by the external transceiver.

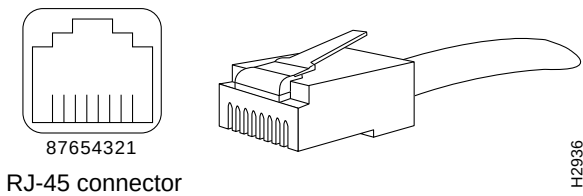
Fast Ethernet RJ-45 Connection Equipment

The RJ-45 receptacle on the I/O controller is configurable for 100 megabits per second (Mbps) and supports IEEE 802.3, Ethernet, and IEEE 802.3u interfaces compliant with 10BASE-T and 100BASE-TX specifications.

The RJ-45 receptacle supports standard straight-through and crossover Category 5 UTP (RJ-45) cables. (See Figure 24.) Cisco Systems does not supply Category 5 UTP cables; these cables are available commercially.

Figure 26 shows the RJ-45 receptacle and plug. Table 7 lists the pinouts and signals for the RJ-45 receptacle.

Figure 26 RJ-45 Receptacle and Plug



Warning To avoid electric shock, do not connect safety extra-low voltage (SELV) circuits to telephone-network voltage (TNV) circuits. LAN ports contain SELV circuits, and WAN ports contain TNV circuits. Some LAN and WAN ports both use RJ-45 connectors. Use caution when connecting cables

Table 7 RJ-45 Receptacle Pinouts

Pin	Description
1	Receive Data + (RxD+)
2	RxD–
3	Transmit Data + (TxD+)
6	TxD–

Note Referring to the RJ-45 pinout in Table 7, proper common-mode line terminations should be used for the unused Category 5, UTP cable pairs 4/5 and 7/8. Common-mode termination reduces electromagnetic interference (EMI).

Depending on your I/O controller RJ-45 interface cabling requirements, use the pinouts shown in Figure 27 and Figure 28 for straight-through and crossover twisted-pair cable connections.

Figure 27 Straight-Through Cable Pinout, I/O Controller RJ-45 Connection to an End Station or DTE

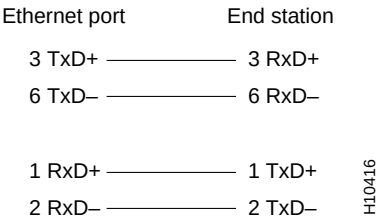
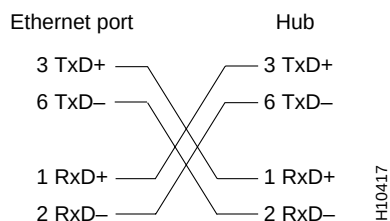
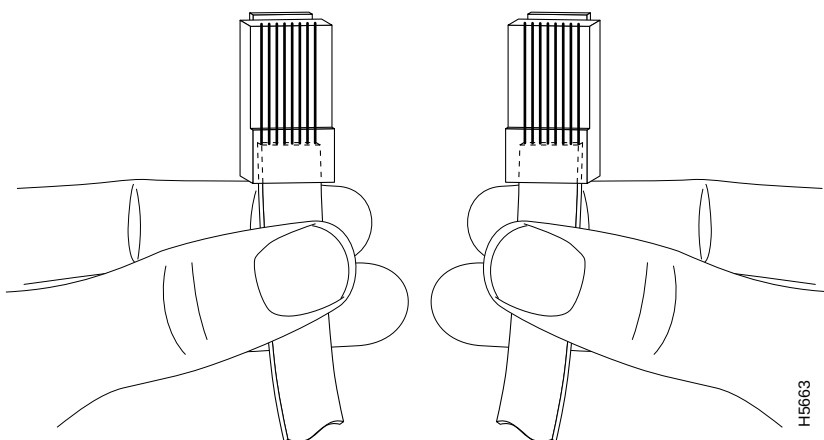


Figure 28 Crossover Cable Pinout, I/O Controller RJ-45 Connection to an End Station or DTE

To identify the RJ-45 cable type, hold the two ends of the cable next to each other so you can see the colored wires inside the ends, as shown in Figure 29.

Figure 29 RJ-45 Cable Identification

Examine the sequence of colored wires to determine the type of RJ-45 cable, as follows:

- Straight-through—The colored wires are in the same sequence at both ends of the cable.
- Crossover—The first (far left) colored wire at one end of the cable is the third colored wire at the other end of the cable.

Console and Auxiliary Port Connection Equipment

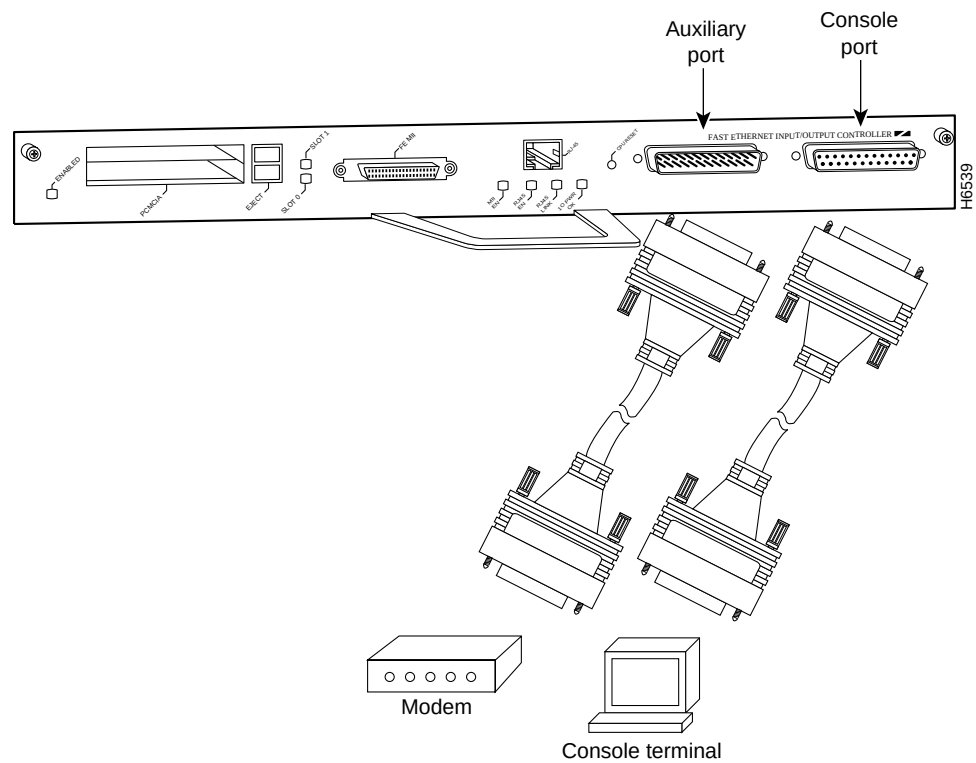
The I/O controller has two EIA/TIA-232 ports: a DCE-mode console port and a DTE-mode auxiliary port. The console port is a DCE DB-25 receptacle for connecting a data terminal. The auxiliary port is a DTE DB-25 plug for connecting a modem or other DCE device (such as a CSU/DSU or other router) to your router. (See Figure 30.)

Note Both the console and auxiliary ports are asynchronous serial ports; any devices connected to these ports must be capable of asynchronous transmission. (Asynchronous is the most common type of serial device; for example, most modems are asynchronous devices.)

Before connecting a terminal to the console port, configure the terminal to match the router console port as follows: 9600 baud, 8 data bits, no parity, 2 stop bits (9600 8N2). You need an EIA/TIA-232 DCE console cable to connect the terminal to the console port. After you establish normal router operation, you can disconnect the terminal.

You must supply your own interface cable between the auxiliary port and the equipment you are connecting. For console and auxiliary port pinouts, see the “Console Port Signals” section on page 44 and the “Auxiliary Port Signals” section on page 45.

Figure 30 Console and Auxiliary Port Connections



Console Port Signals

Both Data Set Ready (DSR) and Data Carrier Detect (DCD) are active when the system is running. The Request To Send (RTS) signal tracks the state of the Clear To Send (CTS) input. The console port does not support modem control or hardware flow control. Table 8 lists the signals used on the console port. The console port requires a straight-through EIA/TIA-232 cable.

Table 8 Console Port Signals

Pin	Signal	Direction	Description
1	GND	—	Ground
2	TxD	<—	Transmit Data
3	RxD	—>	Receive Data
6	DSR	—>	Data Set Ready (always on)
7	GND	—	Ground
8	DCD	—>	Data Carrier Detect (always on)

Auxiliary Port Signals

Table 9 lists the signals used on the auxiliary port. The auxiliary port supports hardware flow control and modem control.

Table 9 Auxiliary Port Signals

Pin	Signal	Direction	Description
2	TxD	—>	Transmit Data
3	RxD	<—	Receive Data
4	RTS	—>	Request To Send (used for hardware flow control)
5	CTS	<—	Clear To Send (used for hardware flow control)
6	DSR	<—	Data Set Ready
7	Signal Ground	—	Signal Ground
8	CD	<—	Carrier Detect (used for modem control)
20	DTR	—>	Data Terminal Ready (used for modem control only)

Installing and Removing a Flash Memory Card

The I/O controller has two PCMCIA slots: slot 0 (lower) and slot 1 (upper). (See Figure 31.)

Note For procedures that explain how to remove and replace the PCMCIA Flash Disk, refer to the *Using the PCMCIA Flash Disk* document that accompanies every Flash Disk shipped from the factory.

Note To avoid potential problems when inserting spare Flash memory cards in your router, we recommend that you reformat all of your Flash memory cards using the recommended minimum Cisco IOS software release for your platform during your regularly scheduled service times. (See Table 5 on page 12.)

The “Reformatting a Flash Memory Card” section on page 47, explains how to reformat a Flash memory card.

To install a Flash memory card in either PCMCIA slot, complete the following steps:

- Step 1** Orient the Flash memory card so that its connector end faces the appropriate slot. (See Figure 31a.)
- Step 2** Carefully guide the card into the slot until it mates with the slot’s connector, and the eject button for the slot pops out toward you. (See Figure 31b.)

Note Flash memory cards do not insert all the way into the PCMCIA slots on the I/O controller; the end of the card protrudes from the I/O controller faceplate. Do *not* attempt to force the card past this point.

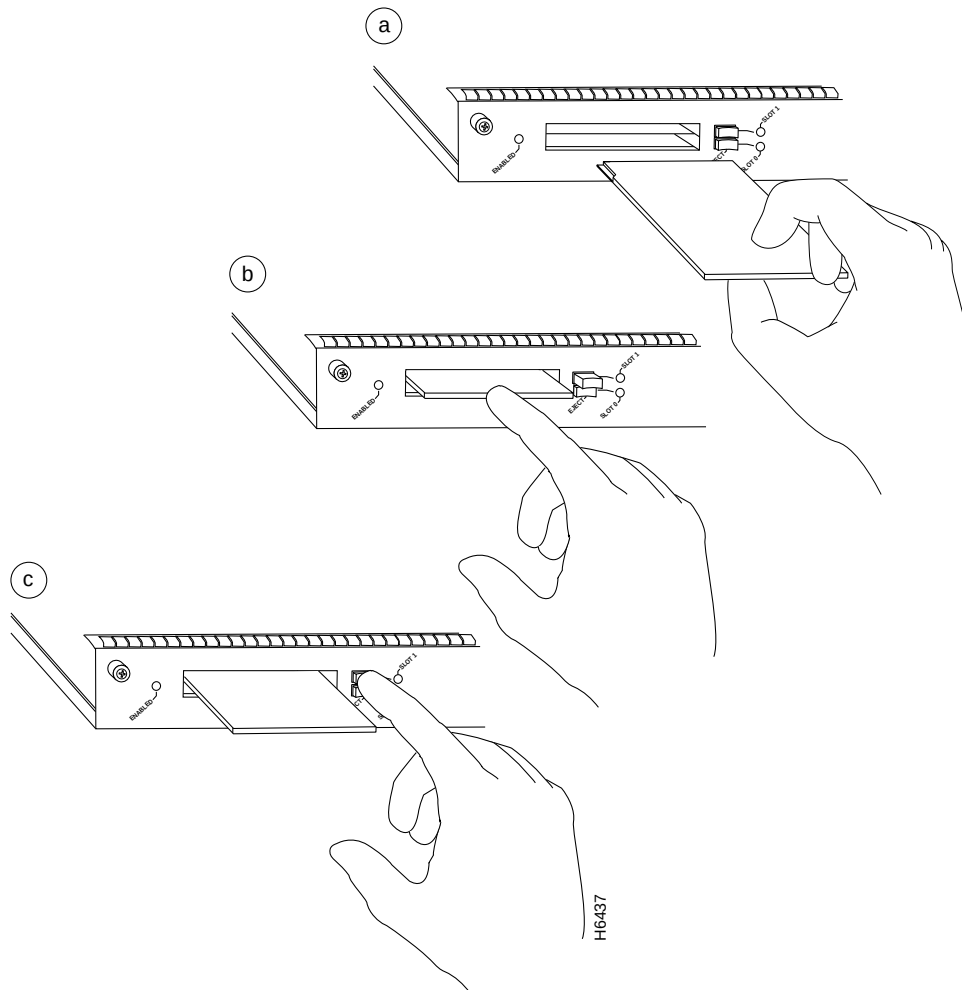
Some older Flash memory cards might have foil tape attached to the outside edge of the card. If you insert one of these Flash cards into the upper PCMCIA slot (slot 1) of an I/O controller installed in a Cisco uBR7200 series router, it might be difficult to remove the card. You should either use a new Flash memory card that does not have the foil tape, remove the foil tape from the older Flash card, or if necessary, use small pliers to remove the Flash card.

This completes the procedure for installing a Flash memory card in either PCMCIA slot.

To remove a Flash memory card from either PCMCIA slot, complete the following steps:

- Step 1** Press the ejector button on the slot. (See Figure 31c.)
- Step 2** Grasp the card and pull it from the slot.
- Step 3** Place the card in an antistatic bag.

This completes the procedure for removing a Flash memory card in either PCMCIA slot.

Figure 31 Installing and Removing a Flash Memory Card

Reformatting a Flash Memory Card

Depending on the circumstances, you might need to use a Flash memory card from another system to copy images or backup configuration files; however, you cannot boot from a Flash memory card that was formatted on another type of system. You must reformat the card before you can use it as a boot source.

Note For procedures that explain how to remove and replace the PCMCIA Flash Disk, refer to the *Using the PCMCIA Flash Disk* document that accompanies every Flash Disk shipped from the factory.

Note To avoid potential problems when inserting spare Flash memory cards in your router, we recommend that you reformat all of your Flash memory cards using the recommended minimum Cisco IOS software release for your platform during your regularly scheduled service times. (See Table 5 on page 12.)



Caution The following formatting procedure erases all information on the Flash memory card. To prevent the loss of important data that might be stored on a Flash memory card, proceed carefully. If you want to save the data on a Flash memory card, copy the data to a server before you format the card.

The formatting procedure assumes the following:

- You have already booted your Cisco 7200 series router or Cisco uBR7200 series router.
- You have access to a TFTP server (meaning you know its name and have connectivity to it) and at least one interface is available over which you can access this server, or a secondary Flash memory card.

Note To ensure access to a TFTP server, you will need to configure at least one network interface using the **setup** command facility. Refer to the *Configuration Fundamentals Configuration Guide* publication for instructions on how to configure network interface using the **setup** command facility.

- You know the filename of the image you want you want to copy to the TFTP server or onto the secondary Flash memory card.

Use the following procedure to reformat a Flash memory card:

Step 1 Insert the Flash memory card into slot 0. (If slot 0 is not available, use slot 1.) See the “Installing and Removing a Flash Memory Card” section on page 45.

Step 2 Copy all the files on the Flash memory card to a TFTP server or a secondary Flash memory card. The following example is for copying files to a TFTP server:

```
Router> enable
Password: <password>
Router# copy slot0:image.name tftp
Enter destination file name [image.name]: image.name
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
CCCCCCCCCCCCCCCCCCCC
Address or name of remote host [tftp.server.name]? tftp.server.name
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!!!!!!!!!!!!!!!!!
Router#
```

Step 3 To reformat the Flash memory card, use the **format slot0:** (or **format slot1:**) command as follows:

```
Router# format slot0:
All sectors will be erased, proceed? [confirm]
Enter volume id (up to 30 characters): MyNewCard
Formatting sector 1
Format device slot0 completed
Router#
```

Step 4 Copy the files you saved to the TFTP server back to the Flash memory card as follows:

```
Router# copy tftp slot0
Enter source filename: image.name
20575008 bytes available on device slot0, proceed? [confirm]
address or name of remote host [tftp.server.name]? tftp.server.name
loading new.image from tftp.server.name (via Ethernet1/0):!!!!!!
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
```

```

!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
[OK - 7799951/15599616 bytes]
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
Router#

```

The Flash memory card is now reformatted and ready to use.

FCC Class B Compliance

The equipment described in this document generates and may radiate radio-frequency energy. If it is not installed in accordance with Cisco's installation instructions, it may cause interference with radio and television reception. This equipment has been tested and found to comply with the limits for a Class B digital device in accordance with the specifications in part 15 of the FCC rules. These specifications are designed to provide reasonable protection against such interference in a residential installation. However, there is no guarantee that interference will not occur in a particular installation.

You can determine whether your equipment is causing interference by turning it off. If the interference stops, it was probably caused by the Cisco equipment or one of its peripheral devices. If the equipment causes interference to radio or television reception, try to correct the interference by using one or more of the following measures:

- Turn the television or radio antenna until the interference stops.
- Move the equipment to one side or the other of the television or radio.
- Move the equipment farther away from the television or radio.
- Plug the equipment into an outlet that is on a different circuit from the television or radio. (That is, make certain the equipment and the television or radio are on circuits controlled by different circuit breakers or fuses.)

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- WWW: <http://www-china.cisco.com>
- Telnet: cco.cisco.com
- Modem: From North America, 408 526-8070; from Europe, 33 1 64 46 40 82. Use the following terminal settings: VT100 emulation; databits: 8; parity: none; stop bits: 1; and connection rates up to 28.8 kbps.

For a copy of CCO's Frequently Asked Questions (FAQ), contact cco-help@cisco.com. For additional information, contact cco-team@cisco.com.

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